Posters

Just Access: Public Library Marginalization of Unhoused Patrons 1
Abbott, Jeremy Keen
"We Just Get Frustrated": Exploring Factors that Shape Information Provision in Disability Services 4
Abubakr, Latifah
Whitman, Samantha A.
Shrivastava, Tulsi
Pine, Kathleen H.
Kim, Pyeonghwa
Lee, Myeong
"If I lose the files, the songs are just gone": Preserving Composers' Process in the Digital Age 7
Akau, Stephanie
Grimmer, Jessica
Digital Activism during the July 36 Protest in Bangladesh 11
Akter, Shohana
Fichman, Pnina
From Utopianism to Technological Realism: A Social Informatics Perspective on Generative AI Discourse 14
Akter, Shohana
Hara, Noriko
Kim, Eugene
Understanding Barriers to AI Use Among Public Sector Knowledge Workers 17
Alon, Lilach
Malinoff, Tali
Social Media Users' Reactions to Posts about Undocumented Immigration in the U.S. 20
Amidu, Gordon
Fichman, Pnina
Diffraction as a Critical Research Methodology 23
Appedu, Sarah
Contribution of Wind Energy Research towards the United Nation's Sustainable Development Goals 26
Aytac, Selenay
Enhancing Digital Health Literacy: Quality Assessment of Wellness and Nutrition Content on eHealthyinfo 29
Basnet, Bibhusan
Lamichhane, Ramesh
Singh, Sweta
Subedi, Prasanna
Yu, Fei
Racial Justice in Library Practitioner Discourse: Implications for AI 32
Black, Kimberly
Mehra, Bharat

Jaber, Baheya S.

Williams-Cockfield, Kaurri C.

In the Weeds: Entity Detection for Plant Based Foods....35

Blake, Catherine

Wang, Ryan

Zeynep, Madak-Erdogan

Testing AI in Law: Inconsistencies, Limitations, and the Need for Human Oversight 38

Blanco, David

Securing Second Sales: An Analysis of the Content of Manufacturers and Platforms on Privacy in the Secondary Market for Smart Home IoT Devices 40

Bonsu, Mildred Adwubi

Yankson, Benjamin

Medical Doctors' Perceptions of Generative AI Across the United States: A Sentiment Analysis of X Posts 43

Borji, Samaneh

Mohammadi Nik, Ehsan

Kalantari, Amirreza

Digital Health Information Access for LGBTQIA+ Communities: A Content Analysis of Community and Institutional Guides....47

Carter, Laura

Kitzie, Dr. Vanessa

Kauffman, Sydney

A Systematic Review of Interactivity in Game-Based Learning with AI....50

Cha, Shinhye

Lee, Jennie

Zapata, Roman

Crafting Effective Metaphors for Science Communication: Insights from Cybersecurity Experts 54

Chen, Wen-Ning

Jeng, Wei

Security and Privacy Challenges in AI-Powered Library Recommender Systems: A Systematic Literature Review 57

Chen, Wen-Ning

Grzybowicz, Paulina

Between Privacy and Empathy: Unveiling Self-Disclosure Patterns in Online IVF Support Groups 61

Chiu, Ming-Hsin Phoebe

The Digital Face of IVF: Examining the Fertility Information Shared by Healthcare Providers on Social Media 64

Chiu, Ming-Hsin Phoebe

Chuang, Ho-An

Developing an Information Credibility Scale for Social Media and AI-generated Content: Insights from Expert and User Reviews....67

Choi, Wonchan

Zhu, Liya

Lee, Hyun Seung
GenAI Competencies in Higher Education: An Analysis of Existing Literacy Frameworks 70
Choi, Wonchan
Bak, Hyerin
Stvilia, Besiki
Zhang, Yan
Prompt Design and AI Response Quality in University Students' Academic Learning Tasks 73
Chu, Kai Ying
Chiu, Phoebe Ming Hsin
Does the Semantic Meaning of Class Names Matter? A Study of the Library of Congress Classification 76
Coble, Zach
Shang, Wenyi
The Fate of COVID-19 Rapid Response Collections: Studying University Initiatives in Pennsylvania 79
Corry, Frances
Starry, Rachel
Academic Libraries in the Age of AI: The Importance of Information Literacy Education 82
Crabtree, Ayiana
Investigating the Existence of AI Policy in Higher Education Institutions in Sub-Saharan Africa 85
Cudjoe, Emmanuel Kwame
Adebayo, John Oluwaseye
Technological Mediation of Trust in Grassroots Organizations: A Case Study of Social Network Platforms 89
Delgado Ramos, Daniela
Chinese Antiquities in U.S. Museums: Online Collections Databases and Open Data Quality 93
Deng, Ximeng
Introducing Collections as Data in Postgraduate and Professional LIS Education 96
Dobreva, Milena
Candela, Gustavo
Paper Work: The Role of Documents in the Development and Uptake of FORTRAN 99
Dodson, Samuel
Bartley, Jane
Mislabeling Debate as Discrimination: Unveiling Political Information Illiteracy in University Students 103
Dowell, Meghan L.
Espinoza Vasquez, Fatima
Visual Semantics of Social Movements Online: ML/AI and Network Analysis for Social Media Messaging 106
Dozal, Laura
Empowering Ethnic Minority Cultures: The Role of Short Video Algorithms in Cultural Sustainability 109
Fan, Shu
Zhang, Shutian
Liu, Jing

Chen, Jinglong
Grit in the Information Machine: Library Professionalism in a World Without Friction 112
Freeburg, Darin
AI and Social Justice in LIS 116
Fu, Hengyi
Ghosh, Souvick
Hofman, Darra
Mehra, Bharat
AI Readiness in Libraries: A Technology–organization–environment framework for Action 119
Fu, Hengyi
Cao, Fenfang
Li, Yuan
Ghosh, Souvick
How Privacy Notifications Shape Privacy Management Strategies among Quantified Self Users 122
Geng, Ruili
Li, Sentao
Yao, Kun
Liu, Zhaohui
Navigating Barriers: Disability, Healthcare Information Seeking, and AI-Enabled Chatbots 125
Gray, Morgan
Threats, Megan
Academic Library and Public School Partnerships to Foster K–12 Professional Development and Learning Opportunities 130
Grimes, Neil D.
Fancera, Samuel
Intermittent and Emergent Social Support for ICT Use in a Remote Rural Community 133
Grisales-Bohorquez, Claudia
Conceptual Framework of Data Governance and Data Organization in Higher Education: Application of the Structurational Model of Technology 136
Guy, Yoshiko Okano
Sun, Ying
Unequal AI Access Enhances Team Productivity through Negative Socio-emotional Reactions and Cognitive Diversity 140
Han, Jiaxuan
Ren, Ruqin
Unequal AI Access Leads to Greater Team Communication Style Differences and Better Task Performance 143
Han, Jiaxuan
Ren, Ruqin
How Academic Structure Shapes Research Focus in Library and Information Science Schools 146
He, Jiangen

Lou, Wen

Conversations Reimagined: Human-AI Collaboration in Analyzing How Creators Explain Security and Privacy Tools 149

Hsieh, Tsai-Hsuan

Lin, Yu-Jie

Huang, Yu-Wen

Chou, Kai-Hsiang

Li, An-Jie

Kung, Li-Fei

Jeng, Wei

An Exploratory Study of Values and Gaps of Literacy in iCaucus Undergraduate Curricula 152

Huang, Li-Min

Chen, Pei-Ying

Navigating AI Literacy: High School Students' Perspectives on AI Tools in a Human-Centered Information Landscape 155

Huang, Li-Min

Wu, Tzu Ying

Tsai, Tien-I

Cheung, Wing-Lam

Information Science Professional's Engagement in Developing Data Documentation Frameworks for Machine Learning 158

Huang, Pao-Pei

Yang, Yu-Ju

The Sweet Spot of Realism: Optimizing Avatar Human-Likeness for Persuasive Impact in Anti-Scam PSAs 161

Huang, Shilan

Goh, Dion Hoe-Lian

Lee, Chei Sian

Wei, Xuan

Xie, Qingling

Wang, Siyuan

A Qualitative Content Analysis: #PalliativeCare on TikTok 164

Imeri, Aylin

Fietkiewicz, Kaja J.

Disrupting Informed Consent: Refusal and Cultural Sovereignty in Indigenous Knowledge Practices 167

Jamieson, Vuyokazi

Chu, Clara M.

Copy, Paste, Innovate: Leveraging Sentiment Analysis and Interviews to Uncover AIGC Literacy among China's Youth 170

Jia, Boyuan

Yan, Pu

Liu, Yicheng
Existing Cues Fail: A Mixed-Method Study on the Identification of Virtual Influencers 173
Jin, Fan
Zhang, Pengyi
Exploring IB/ IP ff Emerging Adults on Health in the Age of Generative AI through a Cognitive Authority Lens . 176
Joshi, Saubhagya
Zaman, SM Mehedi
Empowering Children's Maker-Based STEM Learning through Generative AI in Public Libraries 179
Jung, Yong Ju
Liu, Jiqun
Nazari, Mahdieh
Karahan, Harun
A GenAI Approach to Suggesting Broad and Narrow Queries for Exploratory Search 182
Khakshoor, Hanieh
Hoeber, Orland
AI/Misinformation on Social Media: Users' Appraisal and Emotional Outcomes of Their Response 185
Kim, Kyung-Sun
Sin, Sei-Ching Joanna
Survival Analysis of Career Retention among LIS Professionals of Color 188
Kim, Sunha
Ding, Weiyi
VanScoy, Amy
The Relationship between Spatial Inequality of Public Libraries and Local Extinction in South Korea 191
Koo, Bonjin
Chang, Durkhyun
Kim, Minwoo
Coconut Libtool 2.0: Enhanced All-in-One Data and Text Mining Tool 194
Lamba, Manika
Santosa, Faizhal Arif
Le, Tam
Best Practices for a Digital Empowerment Program Serving Marginalized Communities 197
Lawson, Christopher
Grady, Siobahn
Walker, Patrice
Expanding AI Literacy at an HBCU: The Launch and Impact of the NCCU Institute for Artificial Intelligence and Emerging Research (IAIER) 200
Lawson, Christopher
Grady, Siobahn
Walker, Patrice

Quantifying Urban Change Across US Cities Using the 1930s Redlining Maps: A Preliminary Study 203
Lee, Gie Myung
Lee, Myeong
How Artists Translate Image Needs on Social Media: Preliminary Analysis of Interaction 206
Lee, Hyun Seung
Role Shifts and Engagement Patterns in an Ovarian Cancer Online Health Community 209
Lee, Young Ji
Thaker, Khushboo
Wang, Youjia
Hui, Vivian
Donovan, Heidi
He, Daqing
Brusilovsky, Peter
Effectiveness of GenAI-driven Personalised Nudges in Reducing Procrastination Among Students 212
Lim, Kok Khiang
Lee, Chei Sian
Wings, Wires, and Wit: How Avian Metaphors Illuminate Risks in Cybersecurity and Information Technology ...215
Lin, Shih-Ya
Huang, Yu-Wen
Lin, Yu-Jie
Jeng, Wei
Aligning Reality Through Tri-RealitY: Reconceptualizing Information Acceptance and Cognitive Alignment.....218
Lin, Yu-Jie
Chen, Wen-Ning
Jeng, Wei
Understanding Teenagers' Mental Models of Generative AI: Insights from Drawings and Interviews.....221
Liu, Haolei
Tang, Zhenyi
Generative AI for Art Therapy Informed Visual Emotional Expression 224
Liu, Jiaying "Lizzy"
You, Xinyue Sally
Dillon, Andrew
Zhang, Yan
Preserving the Woman's Voice on the Archival Canvas: Interactive Digital Narrative Mechanisms for Jiangyong Nüshu Driven by Generative Artificial Intelligence 227
Liu, Ke
Reduced Information Anxiety through Academic Library Data Literacy Education 230
Liu, Qiaoyi
Owen, Heather Charlotte

Qin, Jian
Collaboration with GAI in Artistic Creation of Cultural Heritage: Approaches, Challenges and Mitigations.....233
Liu, Ruoxi
Qiu, Haoran
Human-AI Interaction Data Governance in Personal Health Management: Literature and Cases Analysis 236
Liu, Xianrui
Shankar, Kalpana
AI's Usefulness in Assisting with Health Insurance Literacy 240
Lockett, Amanda A.
Novin, Alamir
Conway, Laila
Disclosing Generative AI Use in Digital Humanities Research 243
Ma, Rongqian
Zhang, Xuhan
Wisnicki, Adrian
Toward Agency-Centered AI Literacy: A Scoping Review 246
Maeda, Takuya
Anderson, Hillary
Quan-Haase, Anabel
Willis, Katharine
Gignac, Selena
You Are Allowed to Say More: ChatGPT Censorship on Controversial Topics and Contextual Prompting.....249
Marquez, Diego Jose
Zhou, Kyrie Zhixuan
Xiao, Yunpeng
Sanfilippo, Madelyn Rose
Institutional Legitimacy of Public Libraries in Japanese Urban Policy.....252
Matai, Hiyori
Koizumi, Masanori
The Information Behavior of Theatre Performers: Embodiment, Precarity, and Body Capital.....255
Maxwell, Julia Anne
Persistent Identification of Facilities and Instruments within Scholarly Infrastructure.....258
Mayernik, Matthew S.
Johnson, Andrew
Julian, Renaine
Mundoma, Claudius
Murray, Matthew
Ranganath, Aditya
Hospitality and the Informational At-Home.....261

Mestre, Juliana
Cross-Session Aggregated Search: Organizing and Summarizing Found Resources....264
Momeni, Milad
Hoeber, Orland
What Are They Talking About? Exploring Doctoral Student Interactions in Unstructured Environments....268
Montazeri, Peymon
Bartlett, Joan C.
Generative Artificial Intelligence Practices Among Major Educational Groups in the United States....271
Montiel, Jesus
Kundu, Shuvo
Schlater, Nicole
McLean, Leigh
McLean, Mary
An Exploratory Data Analysis of Keyword Associations in LIS Immigration Scholarship....274
Mortada, Hassan
Shankar, Saguna
Pagan, Sydney
Dodson, Samuel
How AI Advises Young Women: A Disembodied Chatbot's "Diet Tips" Lacks Reassuring Context....277
Novin, Alamir
Maslo, Sophia
Makarus, Brooke
Generative AI Use among College Students in South Korea: Usage, Perception, and Institutional Support....281
Oh, Chi Young
Kim, SuYeon
Ryu, Hohyon
Effective Shared File Management in Cloud Storage for Collaborative Research: Lessons from Successful Cases....284
Oh, Kyong Eun
Exploring Data Sharing in Medical and Health Sciences through Mega Journals....287
Oh, Sanghee
Park, Yunseo
Sim, Seyun
Hearing Refugee Voices: Preliminary Findings on Trauma-Informed Refugee Services in Public Libraries....290
Pan, Xue
Abbas, June
Chie, Noyori Corbett
Navigating Health Information Poverty: International Students' Challenges and Strategies....293
Pan, Xue

Library Workers' Perspectives on Participatory Community Engagement with Immigrants: An Exploratory Sequential Mixed-Methods Study 296

Park, Hayley

Stereotypes, Storytelling, and the (Un)Reliability of Generative AI 299

Park, Hayley

Patel, Jay

Wise, Nikki

Sim, Uhjin

Wang, Yiwen

Williams-Pierce, Caro

Characteristics of Dataset and Model Reuse Patterns on the Hugging Face Platform 302

Park, Jaihyun

Yoon, Ayoung

Assessing the Relationship Between Citizens' Perceptions of AI Adoption in Healthcare: A Cultural Cognitive Perspective 305

Park, Min Sook

Wikipedia and AI for Mapping Cultural Diaspora 308

Peng, You

Lamba, Manika

Herrera-Guzmán, Yessica

"The original PDF score is just completely inaccessible": A Proposed Workflow for Making Archival Music Scores Accessible Using MEI 311

Pineo, Elizabeth

Time Out of Mind: Investigating the Technical and Ethical Impacts of Virtual Reality Tools in Archaeological Studies 314

Pope, Andrew

Disinformation Recognition in Social Media: Effects of Multimodality, Comments and Virality Metrics 318

Qiu, Haoran

Goh, Dion Hoe-Lian

From Field to Database: Scientists' Information Practices for Discovery and Management of Scientific Samples 321

Raia, Natalie H.

Thomer, Andrea K.

"I Wish I Had More Time": Investigating User Onboarding Methods in VR Immersive Analytics 323

Rajasagi, Priya

Chelluri, Hemanth

Seki, Kaoru

Tondreau, Amy

Zuber, Ryan

Boot, Lee

Komlodi, Anita

Representation and Authenticity in AI Generated, Curated, and Mediated Archives 326
Riter, Robert B.
Mehra, Bharat
Poole, Alex H.
Lischer-Katz, Zack
Tribelhorn, Sarah
Wagner, Travis
Data Governance in Practice: Disentangling the Socio-legal and Technical Dimension of Transportation Data 329
Salas-Niño, Liliana
Invisible Barriers: Chatbots, Language, and Access to SNAP Information 332
Salas, M.J.
Rivera, Yonaira
Singh, Vivek K.
Refusal as a Community Practice: Organizing Teach-Ins on Smart City Surveillance with Brooklyn Public Libraries.....335
Sargent, Serita
Assessing the Effectiveness of UI/UX Design in Open Government Data Portal.....338
Sari, Dwi Puspita
Ardhi, Dimaz Cahya
Ma, Derick Chungcheh
Dumas, Catherine
Semantic Organization and Analysis of Ancient Chinese Poets' Biographies: A Multi-Dimensional Perspective ..341
Shen, Xueying
Lin, Litao
Wang, Yizhen
Ou, Shiyan
University Students' Use and Assessment of Chatbots as an Information Resource: An Exploratory Study 343
Shusas, Erica
Forte, Andrea
Trustworthy AI: How Much Does the Public Care?.....346
Sin, Sei-Ching Joanna
An Indexed Account of Ephemeral Culture: Algorithmic Contexts of Memes 349
Smith, Alexander O.
Joh, Una
Hemsley, Jeff
The Differing Perspectives of Health Information Providers on Credible Information Access by Country Income Levels 352
Sullivan, Margaret
Park, Min Sook
Ajayi, Ayoola

Johnston, Jamie Sewan
Use of Eye Tracking as a Method for Health Information Seeking Behavior Research.....355
Syn, Sue Yeon
Lannan, Laura
Bringing Archives to Life: Designing an AI Module for Dynamic VR Experiences from Archival Photographs....358
Talebhaghighi, Farzaneh
Designing Educational Games for Deepfake Detection 361
Tang, Zhong
Goh, Dion Hoe-Lian
Lee, Chei Sian
Five Tools for Workshopping Humanitarian Responses to Harmful Information in Conflict Settings.....364
Tither, Emmy
“Hard Drives Are the Tip of the Iceberg”: Using r/datahoarder to Understand Conceptions of Data Risk.....367
Tither, Emmy
Wagner, Travis
Beyond Technology-First Narratives: Reframing Rural Educators as Information Professionals 370
Uba, Ebubechukwu E.
Intersectionality and Insider/Outsider Dynamics in Mental Health Information-seeking among Chinese LGBTQIA+ Immigrants in the US.....373
Wan, Yi
User Studies in Generative Interactive IR (GenIIR): An ISIC-Informed Systematic Review.....376
Wang, Afeng
He, Daqing
Luo, Zhimeng
Ma, Feicheng
Spatial Dynamics of Local News: Mapping City Co-Mentions in Alabama.....379
Wang, Jieshu
Gundogdu, Tugce B.
Butler, Brian S.
Lee, Myeong*
AnnoLoom: Augmenting Codebook Generation and Annotation with Large Language Models 382
Wang, Lu
Lynch, Duncan
Aghakhani, Elham
Demiris, George
Washington, Karla
Rezapour, Rezvaneh
Huh-Yoo, Jina
Using Agentic AI to Enhance the Quality of Academic Libraries’ Responses for Student Queries 385

Wang, Ning-Chiao

Chou, Yen-Chen

A Holistic Understanding of Chinese Children's Artificial Intelligence Literacy: An Exploratory Study 388

Wang, Ping

Wang, Shiyin

Su, Hang

Development of a Cross-Platform Multi-Scale Instrument for Assessing Usability and Sociability of Queer Online Communities: An Initial Step 391

Wang, Shengang

Digital (Un)Belonging: Black Trans Men’s Information Practices in Marginalizing Sociotechnical Systems 394

Chris Wiley

Development of an AI Chatbot for VR Training for Patron Interactions 396

Williams, Rachel D.

Dumas, Catherine

Borji, Samaneh

Jari, Reza

Zhang, Jiaxuan

Stark, Tommy

Constructing a Domain-Specific Taxonomy by Aligning Multiple Large Language Models’ Outputs 399

Yoo, Ethan M.

Cheng, Yi-Yun

Transforming Perspectives on Data Ethics through Collaborative Game Design 402

Yoon, Sun

Evans, Sarah

Aragon, Cecilia

Herman, Bernease

Liyu, Yang

Molina, Lacy

A Health Literacy Evaluation of Multimedia Prostate Cancer Information on an eHealth Platform 405

Yu, Fei

Zhang, Luxuan

Obeng-Akrofi, Clara

Vondenberger, Amy

Song, Lixin

Understanding Generative AI Risks for Youth: An Empirical Taxonomy for Safer Digital Futures 408

Yu, Yaman

Liu, Yiren

Zhang, Jacky

Qian, Zhiyi

Yun, Huang

Yang, Wang

Will Book Marketing Editors Lose Their Jobs? A Study on Semantic Variations in Book Advertisement Texts by Chinese Large Language Models 411

Zhai, Xihua

Zhang, Xiaoyue

Li, Yiwei

Designers as Co-Creators: Reconfiguring Workflows and Creative Agency in AI-Augmented Design.....414

Zhang, Runsheng

Sung, SeoYoon

Humanities-in-the-Loop: Using Close Reading as a Method for Retrieval-Augmented Generation (RAG).....418

Zhou, Jing

Si, Li

Hou, Wenjun

Cross-Social Media Platform Emergency Knowledge Collaboration Based on Multimodal Heterogeneous Information Networks.....421

Zhou, Wei

An, Lu

Han, Ruilian

Li, Gang

Yu, Chuanming

Augmenting Engagement with Oral History Archives through LLM-Powered Simulations 424

Zhuang, Zhibo

Ma, Rongqian

Just Access: Public Library Marginalization of Unhoused Patrons

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ABSTRACT

Unhoused patrons are uniquely vulnerable to marginalizing public library policies. To first capture the scope of the problem and then to offer a lens for productive critique, I perform a content analysis on the behavior policies of all thirty-five library systems in Los Angeles County, California, USA, describing the methods by which libraries deny unhoused patrons access to library spaces. Then, by applying Iris Marion Young's work on "enabling justice" to these policies, I give a name to these processes: marginalization. I argue that if public libraries are to live up to their name, policies that affect public access need to be viewed through a justice lens. Public libraries that truly are "public" need to design policies that enable justice for all members of their public, and the methods I apply to the Los Angeles County case study offer tools to aid that transformation.

KEYWORDS

Public libraries; homelessness; behavior codes; information access; Iris Marion Young

INTRODUCTION

In this poster, I employ Iris Marion Young's conception of an "enabling justice" (Young, 1990) to surface the oppression submerged in one of public librarianship's greatest "givens": service to all. I argue that despite the normative standard that public libraries have set for themselves in mission statements and codes of conduct to provide library services to the entirety of the communities in which they are embedded, the difference-erasing processes of universalization, impartiality, and discipline submerged within those standards have the effect of reinforcing divides within those communities, particularly by denying meaningful library access to people experiencing homelessness. Young's paradigm helps push our framings of meaningful information access beyond flirtations with status quo-reproducing utilitarianism and towards a justice footing that offers new, more truly public horizons for library spaces.

In pursuit of this, I examine the mechanisms by which libraries construct their preferred version of community within library spaces, focusing on library codes of conduct surrounding hygiene, bathroom usage, and luggage, as well as inclusion framing statements that profess universal service. These categories of rules disproportionately affect people without regular access to bathing and storage facilities. The community I have selected for this essay is Los Angeles County, California, USA, a small country by many standards, but one that is uniquely host to thirty-five different public library systems across its eighty-eight cities and numerous unincorporated communities. The county is less laudably host to a population of people experiencing homelessness that exceeds the populations of sixty-six of those eighty-eight cities, meaning these conduct policies affect tens of thousands of people. The scale of this population makes it impossible to dismiss the effects of these library policies across the region as aberrations or exceptions that prove otherwise benevolent rules. This is a local case study, but it describes a national problem in the United States, as homelessness across the country is hitting unprecedented levels (*State of Homelessness*, 2024). This poster argues for a deeper incorporation of justice into library work through recognition and welcoming accommodation of the unavoidable particularities of existence while homeless, enabling a truly public library.

This work sits alongside several species of justice already explored in LIS literature: literacy and social justice (Saunders, 2017); worker justice (Roberts, 2019; Wildenhaus, 2019); data justice (Milan & Treré, 2019; Taylor, 2017); racial justice and archival silences (Caswell, 2021; Caswell et al., 2016; Ramirez, 2015; Sutherland, 2017); disability justice (Kumbier & Starkey, 2016; Lazakis, 2020); epistemic justice (Patin et al., 2020, 2021); programming equity (Kosmicki, 2019); and more. My analysis complements this previous research by emphasizing the spatial justice aspects of public library policy through a right to the city frame (Mitchell, 2003), and by providing tools through Young's justice framework to analyze and intervene in the institutional library processes that replicate the larger societal oppression of marginalized groups, particularly the unhoused.

CODES OF CONDUCT AND CONTENT ANALYSIS

I compiled this study's data on behavior codes through an examination of the public websites of each public library system in the county. Inglewood does not have a written code of conduct, and thirty-one of the county's remaining thirty-four systems made a digital version of their code of conduct available. All systems made their mission statements available. The three municipal systems that did not provide codes of behavior on their websites are the cities of Covina, Downey, and Signal Hill. According to the last census, 177,471 combined housed residents live in these cities, representing approximately two percent of the county's 9,663,345 housed population, so their absence should not overly skew my study's results. The Los Angeles County system provides coverage for most of the

heavily populated unincorporated areas of the county. The wide breadth of this study is necessary not only to demonstrate the ubiquity of the issue, but also because California public libraries allow anyone with a California ID to register for a library card in any system statewide, regardless of residency. Housed and unhoused residents may be using their local system as well as one or more of their neighboring cities'. So in order to understand the effects of marginalization in any one system, the entire county must be considered. While not perfectly comprehensive, analysis of the thirty-one available systems still sheds light on the accessibility of library services for those experiencing homelessness throughout the county.

I focused on language that appeared to affect or explicitly target the conditions associated with homelessness described above. Twenty-eight systems provided inclusion statements that defined the public they endeavored to serve as all community members, twenty-three listed patron hygiene standards, twenty-seven defined proper bathroom usage, and twenty-five limited the size or type of baggage brought onto library grounds. Significantly, the two systems with the greatest geographic reach and largest social service systems, Los Angeles City and Los Angeles County, had language addressing all four categories. Most of the surveyed libraries also had prohibitions on sleeping, which may impact the unhoused more than housed library patrons, but the degree of impact is less clear than the rules above, so I have omitted those data from this study. The penalty for failure to adhere to codes of conduct was consistent across all systems that provided codes: ejection from the library premises.

The library systems I examined employ many different names for their codes of conduct: rules of behavior, codes of conduct, customer expectations, standards of behavior. The common thread running through all of this terminology is the assumption of patron volition. All the rule titles suggest that patrons can choose to obey or disobey; the possibility that no choice exists for some patrons is not contemplated. This points to the need for a conception of just library access that works to create different choices for people. For this I turn to Young's "enabling justice."

ENABLING JUSTICE

As a supplement and alternative to the distributive paradigm of justice, Young offers up what she terms "an enabling conception of justice" (Young, 1990, p. 39). Young writes:

> I have defined justice as the institutional conditions that make it possible for all to learn and use satisfying skills in a socially recognized setting, to participate in decision making, and to express their feeling, experience, and perspective on social life in contexts where others can listen. (Young, 1990, p. 91)

This is a mode of normative critique that takes aim at the structures of institutions, evaluating them according to the norms of the societies in which these institutions are embedded. Context and particularity are both the key to a meaningful normative evaluation. Particularly, the enabling conception looks to the processes and mechanisms of the institution to determine whether or not they tend to oppress one or more social groups. To aid in this analysis, Young identifies what she believes to be five objective categories of oppression, what she terms "the five faces of oppression": marginalization, powerlessness, violence, cultural imperialism, and exploitation (Young, 1990, p. 40). Of particular interest in the context of the unhoused is marginalization. Young describes the marginalized as "...the people the system of labor cannot or will not use" (Young, 1990, p. 53), a description that certainly includes the unhoused. For Young, we cannot have justice without ending oppression, and we cannot end oppression without turning a critical eye on the institutions that the distributive paradigm tends to universalize into abstraction or givenness.

CONCLUSION

The oppressive marginalization instigated by public libraries forms another brick in the wall between "the public" and the poor. Once a social group is denied access to public goods and public space, it becomes easier to deny them as part of the public itself, partitioning the civil public. At stake here is the possibility of true publicity, which is the ostensible goal of the public libraries I critique in this poster. Young offers a definition of publicity rooted in difference: "A heterogeneous public, however, is a public, where participants discuss together the issues before them and come to a decision according to principles of justice" (Young, 1990, p. 190). Here, Young ties the just processes of democracy to heterogeneity. When a social group is no longer treated as part of the public, the public ceases to be responsive to that group, leading to further oppression.

Public libraries did not start the capitalistic processes that commodify shelter and lead to homelessness, and they cannot end them on their own, but they can help to tear down the wall. They can revise their policies to make them actually inclusive, removing rules that assume middle-class patronage. They can begin moving towards justice by enabling the participation of their unhoused neighbors. They can begin to work towards being deserving of their title: public

GENERATIVE AI USE

I confirm that I did not use generative AI tools/services to author this submission.

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“We Just Get Frustrated”: Exploring Factors that Shape Information Provision in Disability Services

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ABSTRACT
This study investigates how disability service providers’ information practices manifest surrounding disability services and what factors shape their behavior. Through interviews with 61 providers from state, local, and nonprofit agencies from Virginia, U.S., we identify two descriptive patterns of organizational information practices and five multi-level factors: information standardization, policy changes, provider’s tacit knowledge, digital literacy, and community trust. We show how these factors interact in shaping service providers’ strategies to maintain and simplify information provision across fragmented and shifting service environments. These findings suggest that information provision is not a linear transaction, but relational and adaptive practices shaped by institutional and infrastructural complexity. The study provides an initial understanding of how providers manage and coordinate information in disability systems.

KEYWORDS
Information provision; disability services; information sharing practices; information practices; service providers

INTRODUCTION
Direct Support Professionals (DSPs) are frontline workers assisting people with intellectual and developmental disabilities (IDDs) across home, community, and work settings (Assouline & Morin, 2024; U.S. Department of Labor, 2025). One of their critical roles involves managing and providing service information to help IDDs and their family members for their better access to disability services. Information provision is part of information practices, which Lloyd (2010) explains as context-specific, socially embedded activities that support sensemaking. Prior research focused on health information provision shows that healthcare professionals (e.g., nurses, doulas) act as gatekeepers in online communities by balancing visibility, safety, and accuracy to mitigate misinformation (Potnis et al., 2022). Also, physicians using electronic health records (EHRs) often manage tensions between standardized documentation and patients’ lived experiences in providing health information to patients (Souden & Durrance, 2011); pharmacists help refine institutional drug databases by articulating overly broad warnings and filling missing details (Tang et al., 2015). These information practices might be shaped by people’s trust and credibility, as evidenced by research that examined how parents of children with disabilities seek and interpret information (Gibson & Martin, 2019). Yet, the context of disability service information presents new challenges in understanding the process of information provision, due to fragmented nature of disability information systems across the geographical communities and organizations and the presence of misinformation. Disability service providers carry out information work by navigating through complex and fragmented information sources across multiple technologies and institutions (Abubakr et al., 2024; Lee et al., 2024). Therefore, this study investigates how disability service providers engage in information provision practices to provide care to diverse stakeholders within complex disability information landscapes (Lee & Butler, 2019). Through this study, we show that information provision by DSPs is not a one-time transaction, but a relational and adaptive process shaped by providers’ navigation through institutional boundaries.

- RQ1: How can we characterize information provision practices exercised by DSPs?
- RQ2: What are the factors that shape DSPs’ information provision practices?

METHODS
We conducted semi-structured interviews with 61 disability providers from state, local, and nonprofit agencies in the State of Virginia in the U.S. They were recruited via snowball sampling starting from a government agency’s collaborator list. Each interview lasted for about an hour. We examined how disability service providers managed, shared, and documented disability-related information in their daily work. Using a grounded theory approach (Charmaz, 2014), we applied open coding in ATLAS.ti, followed by axial coding (Vollstedt & Rezat, 2019) to identify descriptive codes (e.g., peer-based communication, navigating multiple systems), which informed the development of themes surrounding their information practices. For provider-to-user interactions, we developed comparative tables to visually analyze interview data, as a means to identify key factors (e.g., system gaps, trust,

digital literacy) that shaped providers' information practices, categorizing them into individual, organizational, or community-level influence, as shown in Table 1.

Level	Factor	Description	Illustrative Quote
Org.	Information standardization	When standard categories of disability information are not available, they often create their own.	"*I've created two categories* [..] *been working to decrease all those five*."
Org.	Policy changes	Policy changes create confusion and increase information demands.	"*It is complicated systems* [..] *it changes every other week. Medicaid is always changing, the system is always changing*."
Indiv.	Provider's tacit knowledge	Providers' information provision is often shaped by their lived experience and tacit knowledge.	"*I have a certain select provider agency* [..] *I would refer someone to*." And "*We know they will answer your question.*"
Indiv.	Digital literacy	Disability service providers tailor communication to user tech comfort.	"*They're afraid to struggle* [..] *so we meet them where they are*."
Comm	Trust	Providers adapt their languages to cultural norms, using insider knowledge to build trust.	"*We follow a different dress code* [..] *in hopes of moving them toward accessing services.*"

Table 1. Multi-level factors shaping information provision

FINDINGS

First, provider-to-provider interactions revealed complex information practices that require the navigation of multiple sources (RQ1). When providing disability-related information to other providers (e.g., when a government agency provides information to a non-profit organization), service providers relied highly on multiple platforms and internal repositories. They navigated through both official and unofficial platforms (e.g., Google, a state-funded website) and a mix of internal repositories like Teams or shared drives to find and cross-check information. During this navigation, they often showed frustration, as one shared, "*My brain is still faster than all these other sites* [...] w*e just get frustrated.*" They also shared their workarounds for overcoming technological barriers, as another participant added, "*Different people have different permissions […] we'd pull it from SharePoint or wherever.*" Another pattern was DSPs' reliance on informal and tacit information sources. When information was not available from official sources, disability service providers leveraged peer networks and informal information exchange (e.g., hallway chats, luncheons) to get updated. One noted, "*We don't have a written process* [..] *but we do a lot of collaboration.*" However, there was also risk of misinformation in informal information provision. Together, these examples illustrate two main modes of information provision: formal navigation of scattered systems and informal peer exchange.

For RQ2, we identified five factors that shaped DSPs' information provision practices spanning individual, organizational, and community levels (Table 1), which included information standardization, policy changes, and trust. Also, our results showed that systems, individuals' judgment based on their knowledge, and trust interacted one another in shaping everyday information provision practices. For example, providers' navigation of rapidly evolving disability policies often required lived experience of the providers and their discretionary judgment to interpret shifting rules. "*Things are constantly changing, so it's hard to stay on top of resources* [..] *We have to constantly educate ourselves just to make sure we're giving accurate information*." They also managed trust with the disability communities using their tacit knowledge as a means to provide essential disability information, because a lack of trust often led to a failure in providing information, regardless of its usefulness. For example, in culturally or religiously distinct communities, disability service providers put efforts to address service resistance by leveraging insider perspectives and adjusted their languages in a culturally tailed way, "*I can make the biggest inroads [..] I understand, and I can speak that language.* [..] *We have a different dress code that we follow* [..] *in hopes of moving them to accessing the services that they need.*" Finally, when the rapid changes of policies made the information landscape complicated, providers used their digital literacy and tacit knowledge as a basis to filter and provide accurate information: "*The rules are constantly changing [..] you have to chase them down in so many different spaces that*, [..] *I'm re-education myself and prepping for next year so I'm not giving out bad information.*"

DISCUSSION AND FUTURE WORK

Our findings show that multi-level factors, such as trust and tacit knowledge, and their interactions drive providers' information provision practices. DSPs exercised both formal (e.g., navigating through internal repositories) and informal strategies (e.g., hallway conversations, peer networks) to help stakeholders access essential information within fragmented and shifting service environment. This study reveals that disability service providers' information provision is shaped by the complex interplays between individual, organizational, and community factors. This suggests that their information provision is not a transactional act, but it is an adaptive and constantly evolving practice embedded in fragmented information systems. While providers worked to bridge gaps, the impact of these practices on individuals with IDDs and their families remains underexplored. Future work should include care recipients' perspectives to assess whether provider strategies meet diverse information and communication needs, and how they interact one another in creating the entire information ecology.

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GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

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“If I lose the files, the songs are just gone”: Preserving Composers’ Process in the Digital Age

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ABSTRACT
Digital tools, including notation software, digital audio workstations, and other technologies have become ubiquitous in the process of music composition. Composers likewise use digital means to document their lives and careers. Musical scholarship and the cultural record relies upon continued documentation. Yet, obsolescence of hardware and software, the fragility and variety of digital file formats, media prone to degradation, and poor metadata place this material and subsequent scholarship at risk. This poster presents survey results of composers regarding their process, workflows, and knowledge of preservation practices. Our findings illustrate the challenges faced by music creators, and will inform the creation of a toolkit to bridge the gap between composers’ personal preservation practices and their archival partners’ ability to provide access to the historical record.

KEYWORDS
Digital preservation; cultural heritage; preservation workflows; practitioner survey

INTRODUCTION
The compositional process, studied through sketches, manuscripts, and performances, forms a central portion of our collective knowledge of music history and literature, further contextualized by composers’ records of their professional and personal lives. Its continued study relies on the preservation of these records. Contemporary composers have increasingly adopted digital tools into their processes, generating vulnerable digital documentation (Digital Preservation Coalition, 2024; Wagner et al., 2023; Rosenthal, 2010; Rothenberg, 1998; Kuny, 1998). To enable the possibility of long-term preservation, working composers must undertake proactive personal preservation measures at early stages in the “contact zone” of digital curation (Dallas, 2015). Our survey of working composers investigates current compositional processes as well as their knowledge and implementation of preservation actions.

PRIOR WORK
Practices of personal recordkeeping and its movement into the digital realm are well documented (Cox, 2009; Beagrie, 2008; McKemmish 1996). In the case of artists—whose personal documentation includes their work and artistic outputs—the pitfalls of digital preservation can endanger the cultural record (Rinehart & Ippolito, 2014). For example, a survey of preservation practices of writers reveal disorganized, poorly labeled, and highly distributed digital files, written-over files, and unnecessary duplicates (Becker & Nogues, 2012). For music creators and performers, personal archives or portfolios inclusive of many media types have become de rigor, and yet face threats to preservation, particularly in their knowledge of preservation methods (Bergland, et al., 2023), and most music specific advice exists only in peer-reviewed archival science journals that creators are unlikely to access. A 2021 survey of music scholars explored the challenges of preserving favored proprietary digital notation software at immediate risk for obsolescence and little use of approved and prescribed preservation formats (Akau, et al., 2023).

METHODOLOGY
Our survey was distributed to the composition community through emails to faculty at Big10 universities, major conservatories, and listservs run by the Music Library Association and American Musicological Society. It was boosted through social media posts made by composers after taking the survey. While the survey reached a target audience of composers with substantive material to preserve, distribution may have excluded less established composers.

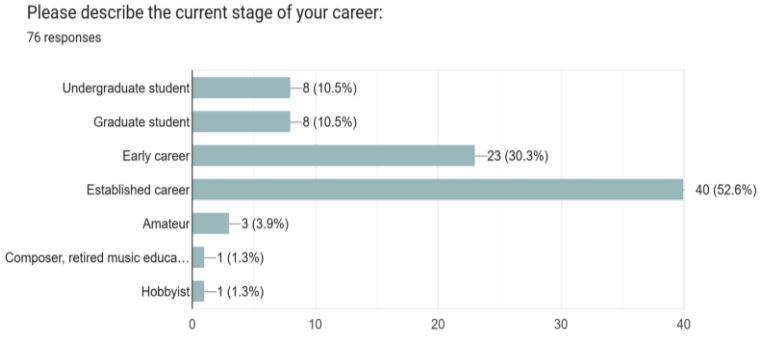

Figure 1. Survey respondents’ current career stage

Of the 76 responses, 40(53%) identified themselves as “established career,” 23(31%) as “early career,” 16(21%) as students and the remaining four identified themselves outside these categories. In an intersecting identity question regarding employment, 25 (33%) reported they were employed in music within academia, and 23(30%) in the music industry. Five (7%) stated they were in a related industry, 7(9%) were employed in unrelated industry, and 16(21%) responded with “other,” many of which indicated they were self-employed as a composer or retired.

COMPOSITIONAL PROCESS

The survey unsurprisingly revealed that all but one of the composers made use of digital tools in their process. The other 74(99%) respondents indicated that they used notation software, such as Sibelius, Finale, or MuseScore. Digital Audio Workstations (DAWs) include software like ProTools, GarageBand, and Apple LogicPro that offer recording, editing, and production capabilities with real or virtual instruments, synthesizers, and effects plug-ins. Currently 6(8%) use DAWs, which are subject to the same market and obsolescence risks. There is a noticeable difference between analog and digital vis a vis sketches vs later versions. Seventy-three (97%) of respondents utilize digital tools at least half the time while composing but only 6(8%) use them exclusively when sketching, a strong indication that recommended preservation actions must address physical and digital materials, as both types are still inherently tied to the compositional process.

PRESERVATION KNOWLEDGE AND PRACTICES

Most respondents use redundant storage methods to preserve multiple copies of files, as their comments reveal a heightened awareness of sudden hard drive or computer failure. While respondents seemed confident that multiple storage methods provided some level of protection, they also remarked on the increasing costs of additional cloud storage or external hard drives. Alongside cost, respondents cited time as a limiting factor, with one stating, “there is only so much time I can devote to [preservation] when I am working and on deadlines.”

Regarding preservation of their creative process, only 1(1%) indicated that they save sketches or early versions. Some cited lack of physical or digital storage space as the main reason for discarding them, while others delete or overwrite because they do not believe they have value compared to the finished work. Since sketches are vital to understanding the creative process and thereby hold more research value than a published version, it is incumbent upon information professionals to convince composers they are worth the space they require.

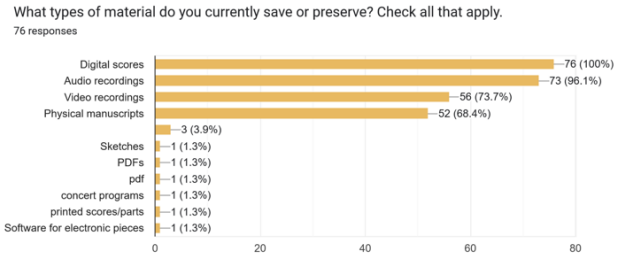

Figure 2. Types of material preserved

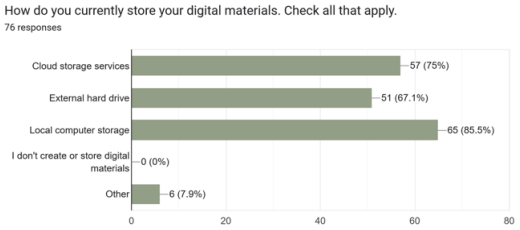

Figure 3. Types of digital storage used

When asked to rate their digital preservation knowledge on a scale from 1–5, the 37(49%) rated themselves average (3). They knew of some steps they could take to mitigate immediate data loss but were unsure of best practices, especially when it came to long-term accessibility of digital materials, illustrating a divide between what composers think they could do to better preserve their work and actions they feel they can realistically undertake. Composers’ sentiments ranged from overwhelm or unawareness to a few who feel certain they are keeping what they need. Most appeared to understand the tenuous position of their digital materials yet lacked the specific instruction or confidence to implement regular preservation actions. Responses demonstrated a consistent interest in learning more about preservation standards, best practices, and options available to increase continued accessibility to their work.

CONCLUSION

Diverse art forms demand tailored digital preservation approaches aligned with their formats and interpretive needs. Our survey is the first to bridge the divide between composers’ creative process and understanding and implementation of preservation. The results illustrate the wide usage of digital tools and generation of proprietary file types most vulnerable to preservation pitfalls. It also points to a concerning lack of knowledge needed to undertake basic preservation. Bringing composers into stewardship of their own materials requires confronting the interwoven qualities of personal archives, and recognizing the growing reliance of institutional archives on the personal preservation and archiving activities. Our planned toolkit—a regularly updated and free to access website—will offer practical workflows, adaptable templates, and guidance on long-term access and storage, allowing composers to capture and maintain their creative legacies.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Jessica Grimmer – Conceptualization (lead), Formal analysis (equal), Methodology (lead), Visualization (equal), Writing – original draft (lead), Writing – review & editing (equal). Stephanie Akau - Data curation (lead), Formal analysis (equal), Visualization (equal), Writing – review & editing (equal)

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Digital Activism during the July 36 Protest in Bangladesh

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ABSTRACT
To address the need to study the role of social media during political crisis in non-Western context, this study investigates Facebook digital activism at the peak of the July 2024 student-led revolution in Bangladesh. Through thematic and lexical analyses of 4,000 comments from 60 protest-related posts, we found that most comments (57.8%) in our sample were ideological, unprovocative, and hashtag-driven. Provocative comments (24.6%) exhibited higher vocabulary density and rhetorical variation than unprovocative comments. While some comments supported the protest, others attempted to delegitimize it. By focusing on this political non-Western crisis, this study challenges the binary view that trolling and digital activism are mutually exclusive, and instead it underscores their overlapping roles in online political discourse.

KEYWORDS
Digital activism; Bangladesh; July Movement; Social media discourse; Trolling.

INTRODUCTION
Digital activism refers to all instances of activism that use digital networks (Shah & Mehta, 2013). At the core digital activism is the use of digital platforms and networks as a means of 'participation' (Ozkula, 2021). Manifestation of 'digital activism' ranges from a simple use of digital tools for presidential campaign (Chang, 2010) to hashtag driven social movement against political and social inequality, such as the cases of #BlackLivesMatter (Yang, 2016) and #MeToo (Mendes et al., 2018). One form of digital activism involves trolling that is driven by social and political agenda; trolling typically involves provocative online discourse, and it is complex, multidimensional, and context-dependent (Sanfilippo et al., 2018). Because of its provocative nature, political trolling can be viewed either as antagonistic or humoristic, and ideologically driven (e.g., Sanfilippo et al., 2017; Fichman & Akter, 2023). Research on digital activism in general, and on online political trolling particularly, has largely focused on Western contexts. Extending our understanding of this form of digital activism to no-Western context, this study focuses on its manifestation during the peak of the Bangladeshi revolution. Often called the July 36 protest, spanning from July 15, 2024, the onset of protest-related violence (Corea & Erum, 2024), to August 5th, 2024, which marked the fall of the political regime (Sobhan, 2025). This study aims to understand the cultural and linguistic depth of the ideological and provocative digital activism and asks: How did trolling and non-trolling behaviors manifest during the July 36 period?

METHOD
Facebook was chosen as the primary data source due to its central role during the July 36 protest, and its widespread use not only among political actors and the public, but especially among college students who were the center of the protest. With 55.6 million users as of April 2024, it remains the country's most dominant platform (Statista, 2024), surpassing X, YouTube, and TikTok (Islam, 2024). We identified 26 protest-related hashtags and selected the top 60 Facebook posts with the highest engagement. We randomly sampled 4,000 comments from these posts for analysis. A codebook was developed inductively and coding at the comment level was performed by one coder, achieving high intra-rater reliability (Kappa = 0.82). Lexical analysis using Voyant Tools was then applied.

FINDINGS
Of the 4,000 comments analyzed, 57.8% were not trolling, with *Advocacy & Solidarity* being the most common subcategory (28.3%), followed by other forms of supportive discourse (Table 1). In contrast, 24.6% exhibited provocative trolling behavior, more often by *serious trolling* (17.6%) than by *humorous trolling* (7.0%). Frequently, *Derailment* (5.1%) aimed to delegitimize the movement by linking it to its political opposition.

Digital Activism Category	Type	Subcategory	Frequency	Percentage
Trolling	Serious	Insulting	131	3.28
		Name calling	212	5.30
		Mocking	194	4.85
		Derailment	203	5.08
	Humorous	Irony	109	2.73
		Satire	60	1.50
		Humor	76	1.90
Total			985	24.64
Not Trolling		Advocacy & solidarity	1133	28.33
		Encouragement	705	17.63
		Emotional appeal	295	7.36
		Justice & accountability	179	4.48
Total			2312	57.80
Other			703	17.58
Grand Total			4000	100

Table 1. Frequency and percentage of codes

Lexical analysis revealed that non-trolling comments, particularly *Advocacy & Solidarity*, had high word counts but low vocabulary density, indicating slogan and hashtags driven repetition (Table 2). Trolling comments, though fewer, demonstrated greater rhetorical complexity and lexical richness. *Derailment* was an exception, lexically resembling the unprovocative discourse, suggesting a strategic use of repetitive discourse (Table 2).

Digital Activism Category	Type	Subcategory	Total words	Unique words	Vocabulary Density	Ave. words per sentence
Trolling	Serious	Insulting	1438	971	0.66	41.1
		Name-calling	1714	1091	0.64	26.8
		Mocking	1722	1118	0.65	55.5
		Derailment	5152	2105	0.38	74.5
	Humorous	Irony	2279	1283	0.56	21.5
		Satire	1089	685	0.63	72.6
		Humor	456	326	0.72	76.0
Not trolling		Advocacy & solidarity	19969	2245	0.11	66.6
		Encouragement	6555	2713	0.41	47.8
		Emotional appeal	11989	2091	0.17	17.7
		Justice & accountability	5498	2226	0.41	32.3

Table 2. Linguistics analysis

Overall, we found that public engagement was dominated by expressive non-trolling support for the protest, while trolling comments introduced a more rhetorically complex layer of discourse, with some efforts to reframe and shift the discourse from the movement's goal.

CONCLUSIONS & FUTURE WORK

Our findings contribute to a growing understanding of how civil resistance in authoritarian regimes is negotiated on digital platforms, focusing on the thematics and lexical analysis of political trolling comments. The study offers a rare empirical insight into online expression of digital activism in the context of a non-Western political crisis. The findings challenge the binary framing of trolling and activism as inherently oppositional. Instead, in the context of political crisis, trolling can play a dual function, both disruptive and supportive forms of digital activism, operating as an intertwined communicative strategy. Besides, the results also reveal linguistic variations between volume-driven activism and rhetorically complex ideological trolling, as forms of digital activism.

The study's limitations include the focus on one event with small data samples only coded by one coder, but this study adds much-needed attention to how online civic expression evolves in a non-Western environment of political instability. While digital activism in Bangladesh shows unique linguistic and political features, it mirrors the phenomena seen in countries like Indonesia (Lee at al., 2020), India (Fatima et al., 2025), and Myanmar (Lim, 2023). Expanding research in this area of global digital scenarios can help researchers reframe dominant theories of online activism and political trolling.

GENERATIVE AI USE

We employed the generative AI tool ChatGPT to check grammatical errors in the text throughout the writing process. The authors assume full responsibility for the content of this submission.

AUTHOR ATTRIBUTION

Shohana Akter: Conceptualization, methodology, data curation, formal analysis, visualization, writing – original draft; Pnina Fichman: Project administration, methodology, supervision, writing – review and editing.

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From Utopianism to Technological Realism: A Social Informatics Perspective on Generative AI Discourse

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ABSTRACT
This paper revisits Kling's (1994) framework for analyzing technology discourse by applying it to expert commentary on Generative AI (GenAI) posted on X (formerly Twitter) from November 2022 to June 2023. Using thematic content analysis on 1,000 top-engaged posts, we assessed Kling's five genres—utopianism, anti-utopianism, social realism, social theory, and analytical reduction—map onto current GenAI discussions. We found notable discourses fell outside these categories, prompting us to introduce a new genre called Enhanced Technological Realism (ETR), which includes Collaborative Tech Assessment (CTA) —current evaluative nature of GenAI discourse, and Tech-futurism —speculative discourse depending on present scenarios of GenAI. This study establishes a foundational mapping of how online communities frame GenAI by applying and extending Kling's (1994) genre framework.

KEYWORDS
Social Informatics; Generative AI; Genre Analysis; Social Media Discourse; Computerization

INTRODUCTION
Generative Artificial Intelligence (GenAI) tools like ChatGPT, DALL·E, and Stable Diffusion has rapidly become integrated into everyday life, influencing fields such as education, healthcare, and law (Aswathy & Nair, 2024; Huang, 2024; Karabacak et al., 2023). Unlike earlier waves of digital innovation, which were often confined to professional or institutional settings (Kling & Gerson, 1977), GenAI is broadly accessible and widely discussed by users across backgrounds on platforms like X (formerly Twitter) (Liu & Wang, 2024). These discussions span from optimistic to critical, often reflecting ideological, ethical, and practical concerns (Sobiech-Buzała, 2023). To understand how such discourse shapes public perception, we draw on Rob Kling's (1994) popular genre framework from the field of social informatics, which identifies five narrative types: technological utopianism, anti-utopianism, social realism, social theory, and analytical reduction. While Kling's framework was originally applied to organizational settings, today's decentralized and participatory online discourse may require expanded or updated genres (Peñalvo & Ingelmo, 2023; Züger & Asghari, 2023) which we proposed in this study in the context of GenAI discourse on social media to examine how people conceptualize emerging technologies. We address the following research questions:

RQ1: How do Kling's (1994) genres capture the discussions about GenAI by experts on X?
RQ2: What are potential emerging genres, if any, to analyze the discussions about GenAI on X?

METHOD
We conducted a two-phase content analysis to examine how expert discourse on GenAI aligns with and extends Kling's (1994) genre framework. Using thematic content analysis (Anderson, 2007) on a dataset from X, collected between November 30, 2022, and June 23, 2023, we found experts' discussion extend multiple professional fields, i.e., "AI scientist," "researcher,", "professor", "writer" or even "Hobbyist" (Hara et al., 2025). In **Phase I**, we randomly sampled 1,000 posts (including replies) and applied Kling's five genres—utopianism, anti-utopianism, social realism, social theory, and analytical reduction (Kling, 1994). Intercoder reliability was acceptable ($\kappa = 0.70$), but our analysis shows 30.4% of posts could not be classified under Kling genres, revealing the framework limitation. Following that, in **Phase II**, we refined our approach by excluding replies (as these were mostly driven by main posts and does not reveal the organic discussion happening online) and analyzing 1,000 high-engaged posts by the experts. This led to the introduction of a new genre, Enhanced Technological Realism (ETR), encompassing two emergent themes: One, Collaborative Tech Assessment (CTA) —grounded in present-focused, experiential critique that users engage directly with GenAI tools, often in practical contexts; and Two, Technological Futurism —is speculative and imagining potential trajectories of GenAI's societal impact based on current scenarios, often reflecting utopian or dystopian narratives from futuristic perspectives.

FINDINGS
Our analysis on expert posts on X using the extended genre framework revealed that Collaborative Tech Assessment (CTA) was the most common genre (23.01%), followed by Anti-Utopianism (19.81%), Tech Futurism (17.36%), and Utopianism (16.88%) (Figure 1). Empirical genres such as Social Realism (7.22%), Social Theory (7.76%), and Analytical Reduction (4.77%), were less frequent.

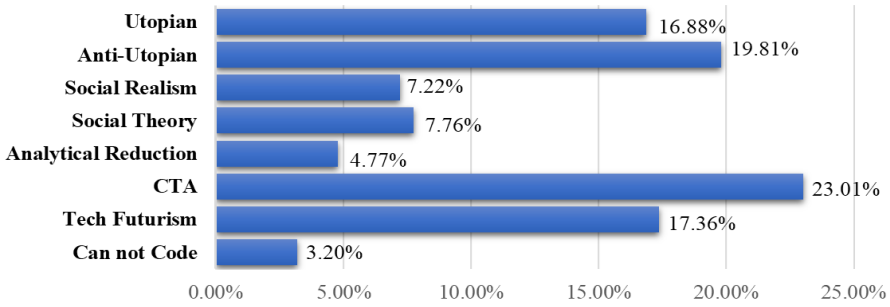

Figure 1. Percentage distribution in each genre

Nearly half of the posts (46.2%) reflected multiple genres (Figure 2). The most frequent overlaps were Utopian + CTA (20.83%) and Anti-Utopian + CTA (18.54%), showing both enthusiasm and skepticism grounded in direct experience. Co-occurrences of utopian and antiutopian genres with Tech Futurism discussion mostly expressed concerns about GenAI's long-term impact.

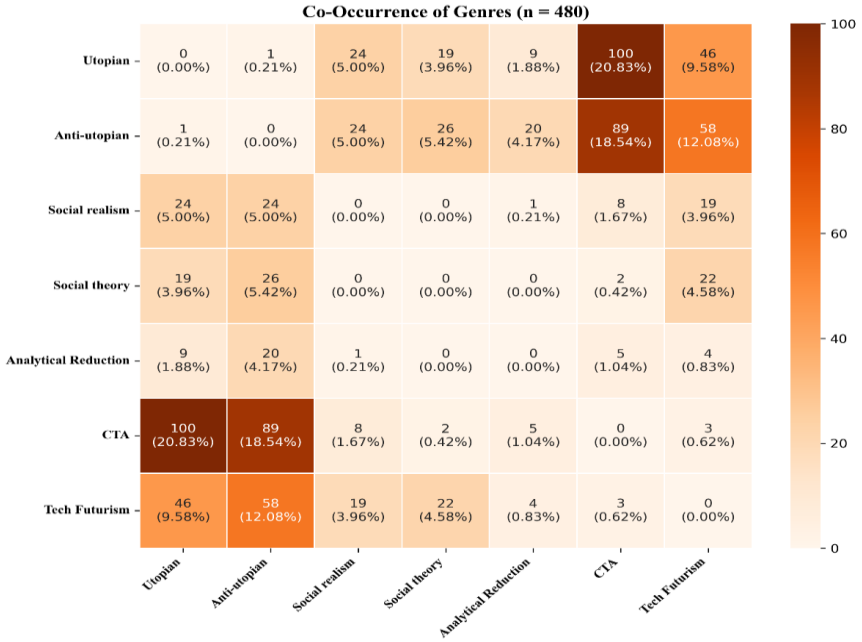

Figure 2. Co-occurrence matrix of the genres

CONCLUSION

By demonstrating that expert discourse on GenAI is more nuanced than traditional genre frameworks can capture, we introduced ETR to capture the evaluative and speculative narratives grounded in hands-on experience and forward-looking insights that shape public understanding of emerging technologies. The frequent co-occurrence of genre types also points to a shift in how technology is socially discussed: not through fixed ideological lenses, but through dynamic, hybridized perspectives. CTA is particularly salient in the current GenAI moment because our theme reflects the growing visibility of hands-on, participatory evaluation of technologies. In contrast to prior technological waves where assessment was confined to institutional or regulatory bodies online discourse about GenAI in social media space invites open-source communities from various field of expertise (hara et al., 2025), and their early adoption in diverse professional settings. This genre captures a shift in how technological authority is articulated by portraying professionals as users rather than experts, co-construct discussion about GenAI through experimentation, public commentary, and shared evaluation. Unlike Kling's traditional genres that focus on ideology or systemic theory, CTA as a practical genre captures how users actively test, critique, and shape GenAI tools in public. As such, CTA is emblematic of how technological realism is evolving, frameworks in social informatics must remain flexible to capture the complexity of decentralized, user-driven assessments.

GENERATIVE AI USE

We employed ChatGPT to review and correct grammatical error of the texts. The authors assume all responsibility for the content of this submission

AUTHOR ATTRIBUTION

First Author: conceptualization, data curation, formal analysis, writing – original draft, visualization; Second Author: project administration, methodology, supervision, writing – review and editing; Third Author: project administration, writing – review and editing.

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Understanding Barriers to AI Use Among Public Sector Knowledge Workers

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ABSTRACT
Artificial intelligence (AI) promises to streamline workplace information practices, yet little is known about its adoption in public-sector contexts. We surveyed 103 Israeli public-sector knowledge workers regarding: (a) their willingness to use AI for 16 work-related information activities and (b) their actual use of such tools. Principal-component analysis grouped the activities into three categories: strategic & analytical tasks, management tasks, and personal applications. Across all categories, paired-t tests showed a large willingness–use gap (e.g., strategic tasks: $M = 3.67$ vs. 1.88, $p < .001$). Multivariate regression revealed that AI availability strongly predicted use ($\eta^2 \approx .14$–.22) but weakly predicted willingness ($\eta^2 \approx .04$–.05). Results suggest that providing access is necessary but not sufficient; motivational and organizational factors moderate adoption. We outline design and policy steps, including trust-building, role-aligned training, and low-risk trial contexts, to bridge the gap and advance human-centered AI in the public sector.

KEYWORDS
AI adoption, Knowledge workers, Information practices, Public sector

INTRODUCTION
Artificial-intelligence (AI) tools are now embedded in search, text generation, decision support, and analytics platforms that public agencies increasingly license for staff (Jin et al., 2025). Yet documented use in government remains sporadic, hampered by opaque "black-box" algorithms that erode trust (Adadi & Berrada, 2018), insufficient organizational support and digital skills (Park & Kim, 2023), and concerns about reliability among employees who must justify their decisions to multiple stakeholders (Kim, 2024). Building on the gap model of information behavior (Alon & Nachmias, 2020), which traces misalignments between ideal and enacted practices, we focus on frontline knowledge workers, professionals whose work centers on knowledge and its management, and ask: RQ1: How does willingness to employ AI compare with actual use across workplace information-practice categories? RQ2: Does perceived workplace availability of AI tools predict willingness and/or use? By grounding adoption questions in information behavior rather than in technology-acceptance generalities, we aim to surface levers uniquely relevant to public-sector contexts - budget cycles, accountability norms, and risk-averse cultures - thereby extending AI-adoption scholarship beyond the private-sector-heavy literature.

METHODS
Participants
Participants in this study were 103 public sector employees, 68.7% female and 31.3% male. The participants' mean age was 44.94 years ($SD = 9.96$). They represented a range of professional experience in the public sector: 25% had 0–5 years of experience, 24% had 6–10 years, 16.7% had 11–15 years, and 34.3% had over 16 years of experience. Participants were employed across various organizations: 72.8% worked in local government authorities, 9.7% worked in government ministries, and 17.5% in related public organizations.

Tools
Data was collected using a self-reported questionnaire that included three parts:

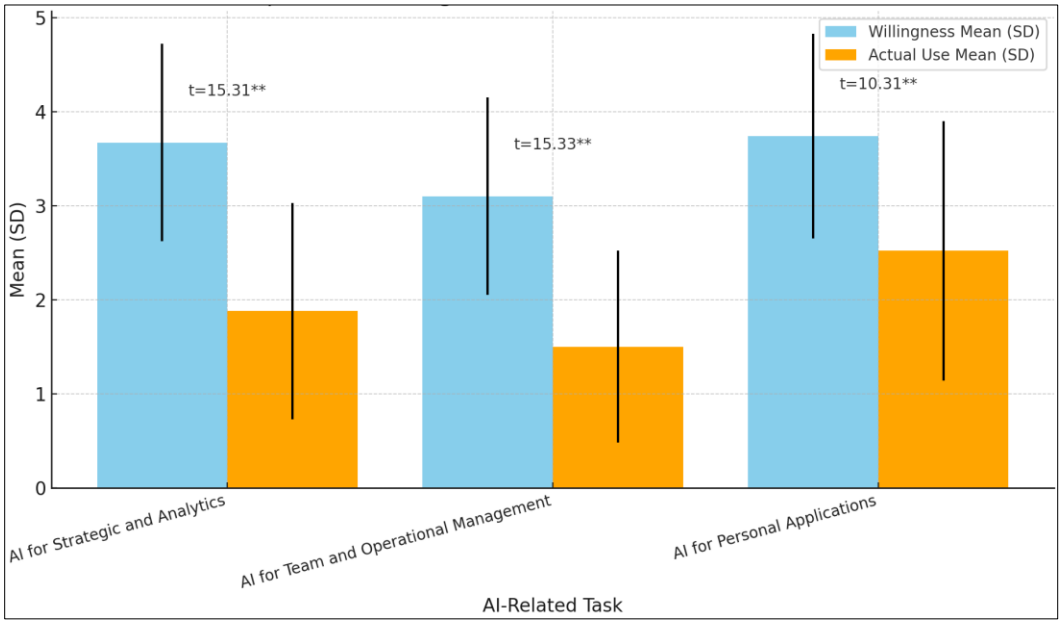
1. Willingness & Use: 16 AI-supported information activities (e.g., "generate work plans," "translate texts") rated twice on a 5-point Likert scale ("How willing…?" / "How often used in last month?"). Varimax PCA (KMO = .88) yielded three factors (α Cronbach = .93, .86, .79) explaining 70.7 % variance: (1) Strategic & Analytical (8 items); (2) Management (5 items); and (3) Personal Applications (3 items).
2. AI Availability: Single 5-point Likert scale question: "To what extent are AI tools available at your workplace?".
3. Demographics: Age, gender, tenure, education, job role.

Procedure and Analysis
The study employed a snowball sampling strategy, where initial participants referred colleagues within their professional networks. To ensure relevance to the study, only employees working in the public sector who answered *Yes* to a screening question confirming their employment status were included. Additionally, respondents were required to state their occupation, allowing us to verify that they met the criteria for knowledge workers. The survey was conducted online and took approximately 15 minutes to complete. Respondents were informed about the study's purpose and provided consent before participation. All statistical analyses were conducted using SPSS.

FINDINGS

RQ1. Willingness Versus Actual Use of AI Information Practices

We conducted a paired t-test to examine the differences between employees' willingness to use AI and their actual AI use across three work-related information practice factors (Figure 1). The results indicated a significant gap between employees' willingness to use AI and their actual use across all three factors.



$^{**}p < .01$

Figure 1. Paired *t*-test for Willingness and Actual Use of AI-based Practices (N=103)

RQ2. The Impact of Workplace AI Access on Willingness and Usage of Information Practices

A multivariate regression showed that AI availability significantly affected the outcomes overall ($F_{(6, 89)} = 4.66$, $p < .001$). Follow-up tests revealed that greater access strongly increased actual AI use but had only a weak effect on willingness, indicating that access alone rarely boosts motivation (Table 1).

Dependent Variable		$F_{(1, 94)}$	*p*-value	Effect Size
AI for strategic and analytics	Willingness	4.23	$p < .05$	4.3%
	Use	26.33	$p < .001$	21.9%
AI for management tasks	Willingness	3.51	$p = .064$	3.6%
	Use	15.08	$p < .001$	13.8%
AI for personal applications	Willingness	4.28	$p < .05$	4.4%
	Personal AI Use	21.82	$p < .001$	18.8%

Table 1. Effects of AI Availability on Willingness and Actual AI Use

DISCUSSION & CONCLUSION

Despite abundant licenses, our results confirm that simply "switching on" AI in public-sector offices is not enough: although perceived availability explains up to one-fifth of the variance in use, it barely moves willingness, revealing a motivational bottleneck that infrastructure cannot solve alone. Adoption is highest in low-stakes, individually verifiable tasks such as translation and text drafting, suggesting that employees first test AI where the personal risk of error is small and outcomes are easily checked, an insight that aligns with concerns over black-box opacity and with evidence that trust and perceived control shape uptake. Bridging the willingness–use gap therefore requires more than hardware and licenses: explainable interfaces, role-aligned training, managerial endorsement, and workflow integration can lower perceived risk, demonstrate tangible value, and embed AI outputs in routine decision processes. In short, effective digital transformation in government must combine technical access with trust-building and context-specific incentives to convert latent enthusiasm into sustained practice. Overall, our three-factor map of AI information practices and the documented availability–use decoupling highlight why digital transformation in government cannot rely on "deploy and hope". Instead, human-centered AI rollouts must blend infrastructure with trust-building, relevance signaling, and iterative workplace learning. The study is limited by its relatively small sample, which includes mostly female and experienced participants. Future work should incorporate qualitative data and test these explanatory levers experimentally while tracking longitudinal adoption trajectories.

GENERATIVE AI USE

We utilized generative AI tools to enhance language. All AI-generated output was carefully reviewed to ensure alignment with the research objectives and the accuracy of the content. The authors take full responsibility for the final content of this submission.

AUTHOR ATTRIBUTION

Lilach Alon: conceptualization, methodology, data curation, formal analysis, writing – original draft; Tali Malinoff: conceptualization, methodology, data curation, writing – review and editing.

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Social Media Users' Reactions to Posts about Undocumented Immigration in the U.S.

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ABSTRACT
Online discourse about contentious and ideological issues like undocumented immigration, trigger massive user reactions. Online hostility towards marginalized groups and its effect on them have attracted scholarly attention. However, reactions to posts on the same issue may take different sides; they may vary not only because of the specific views expressed, but also because of the perceived social roles of those who post about the issue. We examined how users' provocative comments vary among posts by the public, politicians, and immigrants. Given this controversial topic, we found that almost 85% of the 4,800 comments were provocative. We found that the prevalence and nature of these comments varied significantly between posts by the public and those by either by politicians or by immigrants; We also found significant variations between posts on Facebook and on X.

KEYWORDS
undocumented immigration, social media, Facebook, X (Twitter).

INTRODUCTION
Undocumented immigration is a complex issue that spans social, economic, and legal dimensions, and affects multiple countries across different continents. For decades, this issue has attracted much political debate in the U.S., for example, that spilled over into digital platforms. With the increased use of social media platforms, concerns about online hostility and its effect on marginalized groups have attracted scholarly attention (Bozhidarova et al., 2023; Cover, 2022; Fichman & Amidu, 2025; Francisco & Felmlee, 2022; Odağ & Moskovits, 2025; Payne et al., 2025; Thompson, 2023; Van Houtven et al., 2024). These studies suggest that digital platforms can amplify social discrimination and harassment, thereby further intensifying the challenges faced by vulnerable populations.

It is likely that online hostility toward undocumented immigrants resembles those of other marginalized groups, but it is possible that unique variations may be evident; yet scholars have not examined this that takes advantage of the unique vulnerabilities of undocumented individuals in digital spaces. Furthermore, research suggest that posts by individuals with a range of ideological affiliations or different social roles, race, gender, or trigger different reactions; at times when these factors intersect, nuance variation in reactions are observed (e.g., Bozhidarova et al., 2023 Fichman & Amidu, 2025; Francisco & Felmlee, 2022; Odağ & Moskovits, 2025; Thompson, 2023; Van Houtven et al., 2024); these types of reactions may be more prominent on some platforms (e.g., Fichman & Rathi, 2023). To address this research gap, we analyzed users' reactions in discussions about undocumented immigrants on Facebook and X, on posts by politicians, the public, and individuals directly involved, addressing the following research question: What is the nature of users' reactions to posts by undocumented immigrants between politicians, the public, and those involved (undocumented immigrants, their friends, and families), about undocumented immigrants on Facebook and X?

METHODOLOGY
In August 2024, we collected posts on Facebook and X dated August 2014 and August 2024, respectively. To identify posts about undocumented immigrants in the US, we used the specific keywords related to undocumented immigration issues, for example, " #AbolishICE", "Asylum seekers," "Border Patrol," "Border security," "Border wall" among others, to retrieve relevant posts from both platforms. We retrieved a total of 196 relevant posts, including 45 posts on Facebook and 151 posts on X. From X, we retrieved 58 relevant posts by politicians, 55 by the public group, and 38 by immigrants and their supporters. From Facebook, we retrieved 22 relevant posts by politicians, 16 by the public group, and 7 by immigrants and their supporters. We then randomly sampled four posts from each of the three groups on each of the two platforms, for a total of 24 posts. Using exportcomment.com, we scraped all comments posted on each of the 24 selected posts, for a total of 23,152 comments. Subsequently, we randomly selected 200 first-level comments from each post on each platform, yielding a sample of 4,800 comments for further analysis.

We then conducted a content analysis using a codebook with four codes based on Sobeiraj and Berry's (2011) framework of outrage tactics. The codebook includes Ideological Extremizing Language, Sarcasm, Character Assassination, and Insulting. Coding was done at the level of the individual comments, and inter-rater reliability between the two coders resulted in a simple agreement rate of 86%.

FINDINGS

When we analyzed the comments on posts about undocumented immigrants, we found significantly more provocative comments (85%) than non-provocative comments, $\chi 2(1, N = 4,800) = 973.80$, $p < .001$. Like prior research (Fichman & Rathi, 2023), Facebook accounted for 2,027 comments (58.23%) and X accounted for 1,454 comments (41.77%), χ^2 (1, N = 3,481) = 94.32, $p < .001$. Sarcasm was used more than any other provocative comment overall (28.18% of all provocative comments) and on both Facebook (16.35% of all provocative comments) and X (13.50% of all provocative comments). Sarcasm is widely used in online communication, as it allows people to express controversial views with perceived less personal risk on social media by serving as both a tool for humor and a means of criticism (Damayanti & Kaswadi, 2024; Fadilah & Wijayanto, 2024). Overall, ideological language was used significantly less than other provocative comments on Facebook and X, with Facebook accounting for 388 comments (11.15%) and X accounting for 129 comments (3.71%) (Table 1).

	Platform						X^2	*df*	*N*	*P*
							75.8	3	3,481	< 0.001
	Facebook		X		Overall					
	(#)	(%)	(#)	(%)	(#)	(%)				
Ideological language	388	11.15	129	3.71	517	14.85				
Insulting	549	15.77	395	11.34	944	27.12				
Sarcasm	569	16.35	470	13.50	1,039	29.85				
Character assassination	521	14.97	460	13.21	981	28.18				
Total	2,027		1,454		3,481		94.32	1	3,481	< 0.001

Table1. Code frequency by platform

We found that the prevalence and nature of provocative comments significantly differed among the three target groups in their posts on undocumented immigrants χ^2 (2, N = 3,481) = 6.73, $p = .034$ (Table 2). Provocative comments were most prominent on posts about undocumented immigration by immigrants and least common in comments by the public. Furthermore, users' reactions to posts by immigrants involved more character assassination in comments than any other type of provocative comments and more than any other group. In comments on posts by immigrants, sarcasm was not the most prominent tactic; instead, character assassination was more common.

	Target Group							X^2	*df*	*N*	*P*
	Politicians		Public		Immigrants		Total	109.29	6	3,481	<.001
	(#)	asr	(#)	asr	(#)	asr					
Ideological language	139	-2.54	258	7.43	120	-4.57	51				
Insulting	348	1.88	272	-1.49	324	-0.42	944				
Sarcasm	367	1.12	297	-1.70	375	0.52	1,039				
Character assassination	306	-1.16	271	-2.18	404	3.20	981				
Total	1,160		1,098		1,223		3,481	6.73	2	3,481	<.05

Table 2. Code frequency by target groups

CONCLUSION

This study addresses a gap in the literature on users' reactions toward posts by politicians, immigrants, and the public about undocumented immigration issues on Facebook and X. We found that posts about undocumented immigration on X attracted significantly more comments than Facebook posts, but provocative comments on Facebook were more prevalent than on X. This work provides a nuanced insight into the nature of the discourse surrounding undocumented immigration, contributing to research on the role of digital platforms in reducing or amplifying social discrimination and harassment. Future research could examine users' reactions to issues surrounding undocumented immigration on other social media platforms such as Instagram, TikTok, YouTube, and Reddit to capture a more comprehensive view of this discourse online.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Amidu Gordon: Data collection and analysis, and writing – original draft. Fichman Pnina: Conceptualization, supervision, and writing – review and editing.

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APPENDIX

Link to the codebook here.

Diffraction as a Critical Research Methodology

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ABSTRACT

Diffraction is a well-known term in the context of quantum mechanics, where the nature of light and its behaviors can be observed. Diffraction as a critical research methodology was coined by Haraway (1990, 2013, 2018) and Barad (2003, 2007, 2010) in the context of critical science and technology studies (STS). Unlike reflection, where discourse and abstraction are leveraged to fill in the gaps between knowledge and representation, diffraction acknowledges the ontological inseparability of the material and discursive. While diffractive methodologies are growing in popularity in other critical research areas, there is a small but growing number of scholars levering diffractive approaches in library and information research. In this poster, I describe diffraction as a critical research methodology and situate my efforts to build on the existing literature and develop a diffractive approach for critical LIDS research.

KEYWORDS

Diffraction, reflection, methodology, critical research, entanglement

INTRODUCTION TO DIFFRACTION

Diffraction is a well-known term in the context of quantum mechanics, where both the nature of light and its behaviors can be observed (though never simultaneously). Diffraction as a critical, analytical research methodology was coined by Haraway (1990, 2013, 2018) and Barad (2003, 2007, 2010) in the context of critical science and technology studies (STS). However, it is not the first light-based metaphor to make its way into critical research to theorize the nature of knowledge and the beings who create it (Barad, 2007). Scientifically, reflection refers to the phenomenon of light bouncing from an object and onto a reflective surface, where the image of the object is recreated. The viewer sees the object's representation, but may not see the object itself – therefore, they are not engaging with the object directly and may have a distorted and incomplete representation of the original object in their mind. Reflection has long been a popular metaphor among constructivist and interpretivist researchers to cultivate critical self-consciousness and create more equitable research by acknowledging our limited ability to accurately capture and describe reality (Agee, 2009; Mauthner & Doucet, 2003). In this view, it is imperative that researchers define their positionality in relation to the research subject, as has become a common practice in qualitative research (Darwin Holmes, 2020; Lorette, 2023).

Reflection implies an ontologically distant and distinct relationality between the viewer, the reflective surface, the light source, and the object being reflected that diffraction challenges. Different from (but not oppositional to) reflection, diffraction examines both the phenomenon of light moving through space, encountering objects, and creating patterns as well as the nature of the apparatus that makes such patterns appear fixed and measurable. Unlike reflection, where discourse and abstraction are leveraged to fill in the gaps between knowledge and representation, diffraction acknowledges the ontological inseparability of the material and discursive, of the physical and "abstract" worlds of things and thought. In diffractive methodologies, our analysis takes an ontological approach to research that acknowledges the constitutive role of the "apparatus" in the phenomenon – which includes (but is not limited to) the technological instruments used in the research, the theories and methods utilized to make meaning out of the data, and the human body through which these theories and methods are filtered. Currently, diffraction is sparingly used in the areas of library, information, and data studies (or what I lovingly refer to as LIDS). Osterlund et al. (2021) provide an analytically rich and practically oriented exploration of diffractive methods for trace data. In this poster, I describe diffraction as a critical research methodology, situate my efforts to build on the existing literature, and develop a diffractive methodology for critical LIDS research.

DIFFRACTIVE READING AS CRITICAL METHODOLOGY

Diffractive reading is not new and shares similarities with other critical reading approaches, like literary criticism and discourse analysis. However, diffraction more closely aligns with a transdisciplinary sensibility that engages with materiality in its many forms beyond the linguistic, and especially those that accept Haraway's call for critical scholars to engage with techno-scientific knowledge (van der Tuin, 2014). Diffraction appears to be slowly growing in popularity among feminist and decolonial scholars across disciplines who seek new ways to communicate about knowledge, humanity, the future, ourselves, and our research (Barla, 2023; Bellingham, 2022; Bozalek, 2017; Fox & Alldred, 2023; Taguchi, 2012; van der Tuin, 2014). More practically, diffractive reading requires an ontological and epistemological orientation towards post-humanist and feminist/decolonial new materialisms, where texts are seen not as individual representations of a person's knowledge but as "material-semiotic generative nodes, whose boundaries materialise in social interaction" (Bellingham, 2022, p. 376). In other words, texts are just as emergent as my own scholarly identity (Barla, 2023) and gain meaning only through reading them alongside other texts, their

historical contexts, the people who first wrote down the ideas, the lifetime that person led before and after they did so, the technological media through which the text has been transformed to exist on my laptop, and more.

I was inspired to take this approach after reading Haraway's work, "A Game of Cat's Cradle: Science Studies, Feminist Theory, Cultural Studies" (2013). She demonstrates a diffractive reading of "the interknitted discourses named (1) cultural studies; (2) feminist, multicultural, antiracist science projects; and (3) science studies" (p. 64). Crucially, she sees them not as separate spheres but as interconnected, collaborative, sometimes repellant, and always mutually constitutive, which she makes visceral through the metaphor of the game of cat's cradle. Cat's cradle is a hand-game played with a single string with which players make a complex series of careful moves, otherwise they end up with a tangled mess of knots. Disciplinary divisions, like diffracted patterns, are not pre-given nor inevitable but provide lenses through which to read one another. Barad's (2010) paper, "Quantum Entanglements and Hauntological Relations of Inheritance" leverages a diffractive approach to examine the nature of quantum dis/continuity and envision "how electrons experience the world" (p. 240) by simultaneously examining how advancements in science, global conflict, interpersonal relationships, chance, love and atomic bombs all inform what we understand the modern-day study of physics to be.

Barad (2007) eloquently reminds us, "So while it is true that diffraction apparatuses measure the effects of difference, even more profoundly they highlight, exhibit, and make evident the entangled structure of the changing and contingent ontology of the world, including the ontology of knowing" (p. 73). To clarify, Barad does not argue that we should view the world through the lens of physics, nor does she suggest that physics is itself a liberatory practice (Barla, 2023). Rather, quantum physics helps open our modes of inquiry by problematizing our fundamental assumptions about the nature of reality. Scientific experimentation does not measure fixed properties of individual bits of matter. Technological instruments are not only not neutral or objective, they also are not merely socially constructed; instead, technologies are co-constitutive of humans and vice versa. *The phenomenon is the entanglement* of technology, the observer, discourse, power, an apparatus encompassing its history, makers and users. We do not observe, describe or discover phenomenon because we are not only inseparable from the phenomenon, but re-made from it. Therefore, our sense of self, our relationship to the world around us, and the knowledge we create is dependent on tending to these relations and how we come to mediate our differences.

CONCLUSION: BUILDING A DIFFRACTIVE APPRARATUS IN LIDS

Barla (2023) notes that while Barad's theory of agential realism is being more commonly discussed in various interdisciplinary spaces, few have reckoned with the methodological potential of diffraction. He refers to diffraction not as a method that can be applied but as a "methodological sensitivity" (p. 445) that "allows for the emergence of a radicalized (i.e. intra-active) understanding of the role and position of the researcher as part of the world they seek to understand" (p. 450). van der Tuin (2014) refers to this as "posthuman interpellation" (p. 233), which "demonstrates how diffraction is always/already at work when one reads, writes and converses, in a scholarly manner and otherwise" (p. 242). Diffraction is not a mode of analysis we apply to a dataset, but a mode of being that orients us towards patterns of difference and the relationality of agencies within our entanglements. In other words, "diffraction as a methodology sensitizes us to the intra-actions that performatively enact that which counts as real" (Barla, 2023, p. 454) and involves "a focus upon entanglements, diffractions, and interferences in social processes and a data analytic method entailing reading texts together" (Fox & Alldred, 2023, p. 96).

I have begun to identify several intra-disciplinary studies outside of LIDS that have harnessed diffraction as a methodology. Taguchi (2012) leverages diffraction in an education context to "explore the possibilities of considering the agency of the material in the production of knowledge" (p. 267). Bellingham (2022) draws on First Nation and more-than-human paradigms to diffractively read traditional Indigenous Knowledge texts and Australian educational reform policy documents. Through their diffractive methodology, they ask, "What are the particular relations here in this research, for example, with Country, and what emerges from this that makes a difference, and for whom?" (p. 377). Fox and Alldred (2023) examine diffraction as a methodology in applied, practice-oriented sociological research to address critical questions about the researchers' capacity to represent social conditions accurately. Finally, Bozalek (2017) uses diffractive reading and writing to resist the "corporatization of writing in the academy" (p. 43). There currently appears to be little explicit mention of diffraction in LIDS literature. One exception is Østerlund et al. (2020), who propose diffraction as a methodology to study trace data. My dissertation will build upon this body of literature by leveraging a diffractive reading to examine qualitative data (which will be collected once I pass the proposal phase) and develop methodological principles for leveraging such a methodology to study the entanglements between technology, data, information, people, and society in critical LIDS research.

GENERATIVE AI USE

I confirm that I did not use generative AI tools/services to author this submission.

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Contribution of Wind Energy Research towards the United Nation's Sustainable Development Goals

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ABSTRACT

This study presents a bibliometric analysis of wind energy research from 1996 to 2024, examining its contributions to the United Nation's Sustainable Development Goals. The analysis reveals a significant surge in research output, particularly after 2018 and accelerating in 2020. With global representation from 166 countries, China, the USA, and India lead the way. The findings show that wind energy research primarily aligns with SDG 7, focusing on clean and affordable energy. By visualizing the intellectual landscape and identifying key themes and trends, this study aims to provide a comprehensive understanding of wind energy research and illuminate research hotspots.

KEYWORDS

Wind Energy, Bibliometrics, Scientific Productivity, Sustainable Development Goals.

INTRODUCTION

Wind energy is a leading renewable energy source, notable for its vast potential and abundance. The integration of wind power into global energy systems offers a promising solution to mitigate the pressing energy crisis and foster sustainable development, thereby contributing to a more environmentally conscious and sustainable future. Recent literature reviews employing bibliometric techniques reveal a significant surge in wind energy research, with a notable emphasis on review articles. These analyses drew from leading databases, including Scopus and Web of Science (WoS). A growing body of research has contributed to the field of wind energy, demonstrating increasing interest in this area. Several studies have provided valuable insights: Manzano-Agugliaro et al. (2013) reviewed scientific production on renewable energies from 1979 to 2009, and Mao et al. (2015) analyzed research output on alternative energy from 1994 to 2013. Khan and Nasir (2023) examined the application of Artificial Intelligence in wind and solar energy resources from 1991 to 2022. Other studies in the wind energy domain include Gao et al. (2016) analyzed wind power price, Marques et al. (2020) examined wind power competitiveness, and Ceballos-Sandoval et al. (2024) uncovered global trends in wind-power generation projects. Furthermore, Ye et al. (2020) and Chen and Su (2022) contributed to the field with bibliometric analyses of offshore wind power and wind farm research, respectively. Gaede and Rowland (2018) also explored community acceptance of wind power.

These studies reflect the increasing interest in wind energy research and its diverse facets. They demonstrate the escalating interest in wind energy research, encompassing its various dimensions. Key trends emerged, including a growing research trend and China's prominent position in the field. This study explores the major themes in wind energy research, focusing on its contribution to sustainable development. By examining the current state of research, this paper aims to provide insights into emerging trends, key players, and the relevance of wind energy to the Sustainable Development Goals (SDGs). The investigation is guided by the following specific research questions designed to shed light on the role of wind energy in achieving sustainable development:

RQ 1: Scientific Output and Key Contributors: What is the annual scientific output of wind energy research globally, by country, and by institution? Who are the most prolific authors, institutions, and major journals in wind energy research?

RQ2: SDG Alignment: What are the subject categories of wind energy research, and how do they contribute to the United Nation's (UN's) SDGs?

METHODOLOGY

For this analysis, the data collected from Clarivate Analytics' Web of Science (WoS) Core Collection, Science Citation Index (SCI), Social Science Citation Index (SSCI), and Arts & Humanities Citation Index (A&HCI). The search query specifically targeted the keywords "wind energy" with the quotes within the title, abstract, keyword plus, and author keywords fields. Utilizing WoS for this bibliometric study on wind energy research provides a robust and reliable framework for analyzing trends and patterns in this field. The WoS Core Collection is a premier research database, offering comprehensive and interdisciplinary coverage across science, social science, arts, and humanities, making it an ideal source for this analysis. This search, conducted between December 2024 and March 2025, yielded a total of 25,842 publications across all document types. The collected datasets were exported and statistically analyzed to extract the following bibliometric indicators: Yearly trend in wind energy scientific output, Scientific output by country and institution, Scientific output by journal, including publisher names, Journal Impact Factor (JIF), 5-Year JIF, and journal quartile (based on WoS and Journal Citation Reports, 2023 edition), subject categories of wind energy research (based on WoS categories), and assigned SDGs for each paper. WoS Core Collection displays UNs 2030 SDG categories in the "Categories / Classifications" section of full record views,

showcasing 16 of the 17 SDGs. These SDG categories are mapped to Micro Citation Topics for precise classification.

FINDINGS

This section provides an overview of the current state of wind energy research, highlighting the dramatic changes in academic research output from 1992 to 2024. It focuses on the main producers, including countries, institutions, authors, and key journals, most cited wind energy research to contextualize the contribution of wind energy research to the UN's SDGs. Analysis of the WoS database reveals a significant surge in annual wind energy research output, with a marked increase around 2018 and a dramatic acceleration in 2020. A careful investigation of the wind energy research revealed that the WoS dataset for the period of 1996 to 2024 cover diverse geographic extent of 166 countries. China, the USA, and India are the top three countries for wind energy research output from 1996 to 2024. Fifty institutions have surpassed 100 publications in wind energy research. The top four institutions are the Chinese Academy of Sciences (CAS) with 549 publications, Technical University of Denmark with 466, United States Department of Energy (DOE) with 464, and Indian Institute of Technology System with 445. *Energies* is the leading journal with the highest output of papers in wind energy research (1378 papers), followed by *Renewable Energy* (1313), *Renewable* (915), *Sustainable Energy Reviews* (794), and *Energy* (600). Not surprisingly, out of the top 20 publication venues, 12 journals were ranked in the 2003 Journal of Citation Reports' first quartile, showing that the topic is being published in prestigious venues.

The multidisciplinary nature of wind energy research is evident in the 183 WoS categories identified in the dataset. The top categories include Energy Fuels (42.4%), Green Sustainable Science Technology (17.6%), Engineering Electrical Electronic (17.15%), Environmental Sciences (10%), Thermodynamics (6.7%), and Environmental Studies (6.5%). These categories reflect the breadth of disciplines contributing to wind energy research. Wang, Zhong Lin of Georgia Institute of Technology was the leading author with 87 research articles published about wind energy for the period 2007-2024. He was followed by Wang, Jianzhou of Dongbei University of Finance with 73 publications, Sing, Bhim of Indian Institute of Technology with 71 publications.

This study examined how wind energy research contributes to the UN's SDGs and tracked research progress toward achieving these goals. The WoS SDG scheme maps individual SDGs to Micro Citation Topics, enabling users to refine and analyze research according to 16 SDGs. By assigning relevant Micro Citation Topics and their associated publications to one or more SDGs, this scheme provides a powerful tool for tracking research progress toward achieving the UN's SDGs. An analysis of 25,842 wind energy research papers revealed a strong alignment with the UN's SDGs. The most prevalent SDG categories were SDG 7: Clean and Affordable Energy: 15,202 papers (58.83%), SDG 13: Climate Action: 5,276 publications, and SDG 11: Sustainable Cities and Communities: 3,646 papers (14.11%). A detailed analysis of wind energy research output from 1996 to 2024 reveals its distribution across Sustainable Development Goals (SDGs). However, 6,581 records (25.46%) were excluded due to missing SDG data.

CONCLUSION

Wind energy research plays a crucial role in realizing UN SDG 13, which emphasizes urgent climate action. By supporting the five targets of SDG 13, strengthening resilience, integrating climate change into national policies, enhancing climate education, and promoting climate planning in vulnerable communities - wind energy research can help mitigate climate change and promote sustainable development. SDG 11 prioritizes sustainable cities and human settlements. Wind energy plays a vital role in achieving this goal by providing renewable energy, powering sustainable cities, reducing air pollution, enhancing energy security, and promoting sustainable transportation and economic growth. Wind energy research addresses these key indicators, contributing to the achievement of SDG 11. SDG 9 focuses on resilient infrastructure, sustainable industrialization & innovation. Wind energy supports this by developing infrastructure, driving industrialization, fostering innovation & integrating renewable energy, generating economic benefits. The WoS categories assigned to SDGs 7, 13, 11, and 9 in the wind research sample indicate a strong impact, reflecting the significant contributions of wind energy research to these sustainable development goals.

This study has two primary limitations. First, 25.5% of Web of Science records lacked SDG data. To overcome this obstacle, a previous study (Aytac et al., 2023) utilized the OSDG API (https://osdg.ai) to categorize all scientific articles into their respective SDGs at the article level. Furthermore, journal editors and librarians can encourage authors to assign relevant SDGs and promote SDG inclusion alongside keywords, enhancing article discoverability and impact. Second, the study's sample size and language bias affect generalizability. Future research should address these limitations by including non-English journals, expanding the sample size, and utilizing databases like Scopus for a more comprehensive understanding of wind energy research. By addressing these limitations, future studies can provide a more comprehensive understanding of wind energy research and its alignment with the UN's SDGs. By mapping the intellectual landscape and pinpointing key themes and trends, this research aims to provide a

thorough understanding of wind energy research, highlight emerging research hotspots, and connect wind energy research output to global sustainability initiatives.

GENERATIVE AI USE

I confirm that I did not use generative AI tools/services to author this submission.

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Enhancing Digital Health Literacy: Quality Assessment of Wellness and Nutrition Content on eHealthyinfo

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ABSTRACT
Consumer health informatics is becoming increasingly important in a world where more than 5 billion people rely on the internet and social media for health information. eHealthyinfo is a physician-initiated and reviewed artificial intelligence (AI) applied digital health information website, aiming to be essential in advancing health literacy and promoting preventive health behaviors. To assess the effectiveness of its digital content, we conducted a mixed-methods evaluation of 13 wellness and nutrition videos randomly selected from eHealthyinfo, representing 30% of its relevant content. Two independent reviewers used the Patient Education Materials Assessment Tool for Audiovisual Materials (PEMAT-A/V) and the modified version of the CDC Clear Communication Index (CCI) to evaluate each video. Website log data were also analyzed to assess levels of user engagement. The average PEMAT scores were 89.5% for understandability and 100% for actionability, while the average CCI score was 94.4%, indicating the content was understandable, actionable, and clear. Weblog analysis revealed 16,000 active users, with an average engagement time of 41 seconds per user and a 27% average bounce rate for the examined year. eHealthyinfo demonstrates a strong potential as a digital health education tool, with high-quality, user-friendly content.

KEYWORDS
eHealthyinfo; Consumer Health Information; PEMAT; Clear Communication Index; Health Literacy

INTRODUCTION
In today's digital age, consumer health information (CHI) plays a vital role in improving health literacy and, ultimately, health outcomes. Studies have shown that digital CHI not only enhances health knowledge but is also strongly associated with positive health behaviors, including increased participation in preventive screenings and self-management of chronic diseases (Causio et al., 2024; Corvo et al., 2024). As a new CHI platform initiated and reviewed by a group of physicians, eHealthyinfo promotes health literacy through offering educational videos exclusively (E Healthy Info, 2022). Since the effectiveness of these resources relies on their clarity, actionability, and relevance to users' needs, this study aimed to evaluate these qualities by leveraging validated health literacy assessment tools and user website engagement data. The insights will guide further user-centered and evidence-based improvements to the platform.

METHODS
We conducted a mixed-methods evaluation of the wellness and nutrition videos available on the eHealthyinfo platform. A purposive random sample of 13 of 42 relevant videos (31%) was selected to ensure overall representation within this category. Two validated health literacy instruments, the Patient Education Materials Assessment Tool for Audiovisual Materials (PEMAT-A/V) (AHRQ, n.d.) and the modified Centers for Disease Control and Prevention Clear Communication Index (CCI) version (CDC, n.d.), were used for content evaluation. The PEMAT-A/V assessed understandability with 13 items and actionability with 4 items, while the CCI modified assessment evaluated the main message (core), clarity of behavioral recommendations, use of numerical information, and discussion of risks. Two reviewers with no affiliation to eHealthyinfo independently assessed each video. Agreement between reviewers was calculated using Cohen's Kappa for PEMAT-A/V and the Intraclass Correlation Coefficient (ICC) for CCI scores. Discrepancies were reviewed by a third reviewer and resolved by consensus of the three reviewers. A PEMAT- A/V OR CCI score of 90% or higher means the video is rated highly for being easy to understand (understandability) and for clearly showing what actions viewers should take (actionability). Reviewers assess aspects such as the use of plain language, logical flow, visuals that support the message, and specific, actionable recommendations. High scores reflect content that's clear, concise, and accessible for the general public.Additionally, Google Analytics data from the eHealthyinfo website was extracted for a 12-month period (May 31, 2024, to May 31, 2025) to identify patterns of user engagement, including but not limited to nutrition and wellness content. Descriptive statistics were used to summarize scores and website engagement data using RStudio V2023.

RESULTS

Content Quality Evaluation

The inter-reviewer agreement was substantial, with a Cohen's Kappa of 0.69 (for PEMAT scores) and an intraclass correlation coefficient (ICC) of 0.79 (for CCI scores). The average PEMAT understandability and actionability scores were 90% (±3 %) and 100% (±0 %), respectively. The average CCI score was 94 (± 5%), indicating good communication practice.

User Engagement Metrics

Google Analytics data from the website revealed 16,000 active users, with an average engagement time of 41 seconds per user and a 27% average bounce rate for the examined year. The geographic distribution of website visitors indicates that the highest traffic cames from the United States (5,400 users), followed by India (1,900), the Philippines (804), the United Kingdom (759), Canada (584), and Nepal (438). The primary sources of website traffic were organic Google search and direct visits, indicating the platform's reach and user interest in the wellness and nutrition content. Nearly 63% of the visits were from mobile devices, indicating the site is moible friendly.

Discussion

The understandability, actionability, and clarity of the sampled videos are all above 90%, indicating that the eHealthyinfo platform delivers user-friendly, comprehensible, and actionable content. This lays a strong foundation for clear and reliable consumer-grade health communication.

The user engagement analytics data shows a broad international reach, particularly across South Asia and English-speaking countries, highlighting key regions for strategic content development and targeted engagement efforts. The website attracted 16,000 active users over the year, with a strong bounce rate of 27%, indicating that most visitors interacted with more than one page. However, the average engagement time of 41 seconds suggests limited content consumption or shallow interaction. While traffic and retention are promising, enhancing content depth, incorporating interactive features, and refining user flow could further improve engagement. The web log analysis shows a significant amount of mobile traffic, particularly from countries with high smartphone usage; therefore, a mobile-first, responsive design strategy is essential for future platform upgrades. Regular cross-device testing and mobile speed audits should be conducted.

By building upon the strengths identified in the findings, we developed a strategy based on the Plan-Do-Study-Act (PDSA) cycle (Figure 1). We will begin by reviewing videos with lower PEMAT and CCI scores and follow a structured improvement process using the PDSA cycle. This approach will help us identify specific issues, revise and pilot new content, re-evaluate quality and engagement metrics, and integrate lessons learned into future workflows to ensure all videos consistently meet high-quality standards.

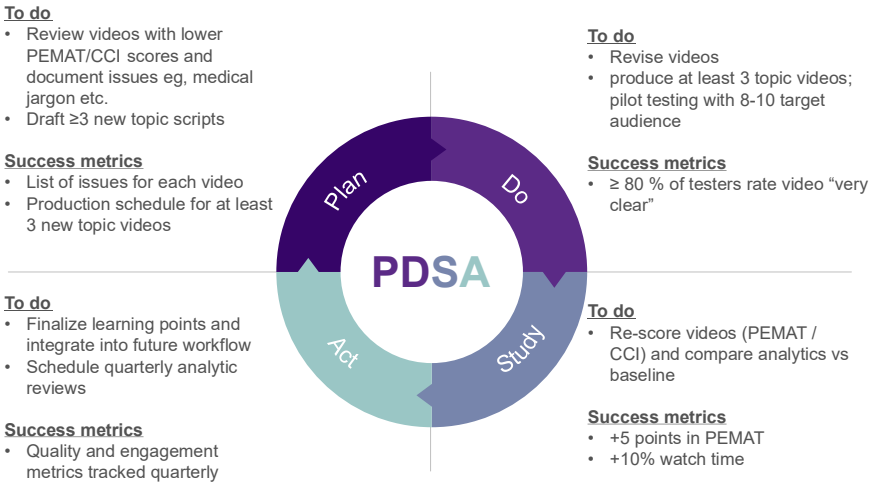

Figure 1. PDSA Cycle to Enhance Quality of eHealthyinfo Videos

CONCLUSION

This study presents a practical framework for evaluating digital health content using validated health literacy tools, providing clear benchmarks for understandability, actionability, and communication effectiveness. Our findings demonstrate how platforms like eHealthyinfo can serve as scalable models to strengthen health literacy, making this work valuable for public health professionals, educators, and digital content creators. We propose that the PDSA cycle, a strategy developed for eHealthInfo videos, can be adapted to other digital content on similar platforms, enhancing the quality and health literacy levels of consumer-facing health communication.

GENERATIVE AI USE

We employed generative AI tools to assist in the creation of video content only. These tools were not used in the authorship of this submission. All AI-generated video outputs were reviewed and evaluated by the authors for accuracy and appropriateness. The authors assume full responsibility for the content of this submission, with Grammarly used solely for grammar and spelling checks.

AUTHOR ATTRIBUTION

First Author: conceptualization, methodology, data curation, formal analysis, writing original draft; Second Author: data curation, formal analysis, visualization, writing – review and editing; Third Author: data curation, project administration, writing – review and editing. Fourth Author: methodology, data curation, formal analysis, writing; Fifth Author: conceptualization, methodology, writing – review and editing.

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Racial Justice in Library Practitioner Discourse: Implications for AI

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ABSTRACT
This study presents preliminary results of an action research project exploring racial justice in U.S. southern public library communities and discusses the implications of its findings for AI bias. Two research questions are addressed: "How is racial justice conceptualized by the LIS practitioner community in the American South?" and "What are potential implications of racial justice discourse in race-related AI bias?" Thematic analysis and interpretative description (ID) were performed on data that was gathered from a strategic action plan created from a survey of southern U.S. public library staff. Public library staff have defined "racial justice" in terms of the constructs of access, equity, participation/inclusion, representation, accountability, and promotion/support. The results of this characterization of racial justice have implications for remediating race-based bias in artificial intelligence systems by promoting the inclusion of more training and operational data gathered from an emic perspective.

KEYWORDS
AI bias, antiracism, social justice, action research, public libraries

INTRODUCTION
Racism has been defined as "a system of advantage and disadvantage based on social, historical, and cultural constructions of race and ethnicity." (Salter and Adams, 2013, p. 414). A more comprehensive understanding of racism, structural racism, is defined as a set of social, economic, cultural, political and economic relationships that are systemically built into the structure of society and everyday life and that can exist independently of individual bias (Salter and Adams, 2013). A transformative force developing alongside the enduring reckoning over racism is the rise and ubiquity of artificial intelligence, a system of computing machines, high computational capacity, algorithms and massive datasets used to drive innovation and to support decision-making in the most important spheres of contemporary life including finance, employment, transportation, healthcare, energy, government and national security. As an artifact of human creation, AI has been described as having racial bias (Leavy et al, 2021).

PROJECT: CIVIC ENGAGEMENT FOR RACIAL JUSTICE IN PUBLIC LIBRARIES
This is a report of preliminary findings of an action research project, "Civic Engagement for Racial Justice in Public Libraries (RJ@PL)," which was funded by the Institute of Museum and Library Services' *National Leadership Grants for Libraries (NLG-L)– FY 2022 Guidelines* granted to the University of Alabama and Chicago State University from August 2022 – July 2025 [LG-252354-OLS-22]. The goals of RJ@PL are to assess U.S. Southern public library efforts to promote racial justice through civic engagement, to generate and operationalize a responsive and participatory planning process that furthers racial justice and to implement key components of strategic action plans that support antiracism in various domains of community life. Part of data gathering for the project consisted of a needs assessment which included gathering qualitative data from surveys of southern public librarians and their service communities and creating strategic planning exercises that were implemented through 12 monthly online workshops/discussions with library practitioners (Mehra et al., 2025).

RESEARCH QUESTIONS
This study seeks to understand a fundamental aspect of antiracist practice – how racial justice is conceptualized—which is done by an examination of discourse from RJ@PL participating library staff. The second question explores the implications of this conceptualization of racial justice in racial bias in AI models and applications. The research questions are as follows:

RQ1 – How is racial justice conceptualized by the LIS practitioner community in the American South?
RQ2 – What are potential implications of racial justice discourse in race-related AI bias?

LITERATURE REVIEW
Artificial intelligence (AI) has been defined as "systems that display intelligent behaviour by analysing their environment and taking actions… to achieve specific goals." (European Commission, 2019, p. 1). The integrity of AI implementations is subject to many problems endemic to a society that struggles with any problems of a structural nature such as racism. Societally structural concerns can and do result in biased AI systems (Cave and Dihal, 2020; Leavy et al, 2021). Biased AI systems can result in decisions that are discriminatory and that may reinforce or accelerate structural problems that already exist in society. The sources of bias in AI are many: such as

problems in “epistemic uncertainty” or the creation of AI algorithms created around nebulous ‘goals’ (Roselli et al., 2019; Schwartz et al., 2022; Miragoli, 2024), problems with bias in datasets (including aleatoric uncertainty) used for training and production (Ferrer et al., 2021; Silberg and Manyika 2019; Varona and Suárez, 2022; Fountain, 2022), the lack of transparency and accountability of data (Roselli et al., 2019; Challen et al., 2019), and biases in AI deployment such as ‘generative bias’ (Ferrara, 2023). On a societal level, the widespread use of such biased AI systems can entrench discriminatory narratives and hinder efforts toward equality and inclusivity.

METHODOLOGY

Evidence to support answers to RQ1 was captured in a series of questions on the survey distributed to public library staff asking respondents to describe, in narrative form, racial justice in each of eleven domains of community life. The researchers analyzed the raw data from the surveys and then developed a summary of responses which was the basis for the draft of the strategic roadmaps used in the monthly workshops with public library staff where practitioners discussed racial justice in each domain and revised and finalized the strategic roadmaps. A thematic analysis was performed on the strategic roadmap summaries to develop a response to RQ1. Thematic analysis is an interpretive qualitative research method for “identifying, analysing and reporting patterns (themes) within data. It minimally organizes and describes ...[the] data set in (rich) detail. … and interprets various aspects of the research topic” (Braun and Clark, 2006, p. 79). RQ2 was addressed using interpretive description of the same dataset used to answer RQ1. Interpretive description (ID) is a combination of phenomenological approaches, grounded theory and ethnography, and is a non-categorical qualitative research method where “researchers examine clinical phenomena with the goal of identifying themes and patterns among subjective perspectives while also accounting for variations between individuals” (Hunt, 2009, p. 1285).

FINDINGS

The dataset used to generate the findings to RQ1 were the results of a thematic analysis of 186 surveys completed by library staff working in the U.S. South about their library’s information offerings, activities and initiatives related to racial justice in eleven domains of community life. The RQ1 findings indicate six facets (themes) of the definition of racial justice described by public library staff: ACCESS (equitable access to resources in some dimension of community life or the library’s act of providing access to either resources/information about resources), EQUITY (equitable treatment of racially minoritized individuals by both society/libraries or equitable distribution of resources or equitable pedagogy used by libraries), INCLUSION/PARTICIPATION (accommodation of racially minoritized individuals or the inclusion of these individuals in a specified facet or domain in community life), REPRESENTATION (existence of accurate information about individuals from racially minoritized groups and making sure these individuals were represented as part of the community), ACCOUNTABILITY (accountability to society for the impacts of racism integrating the defense of the rights of racially minoritized individuals; this is also expressed as defending their protection by society), and PROMOTION/SUPPORT (library’s and society’s support of racial justice in every domain of community life).

Analysis of the facets of the conceptualization of racial bias for RQ2 reveals the presence of a simultaneous and dual emic and etic understanding of the term as it appears in the discourses of library staff. Emic perspectives of a discourse refer to the insider’s perspective of a “particular culture in its own terms” while etic perspectives are the outsider perspectives of researchers who “attempt to describe differences across cultures in terms of a general, external standard.” (Morris et al., 1999, p. 781). The meaning of the term “racial justice” described by public library staff exhibited a dual conceptualization of both emic and etic perspectives in terms of capturing the traits of broader society (etic) to adhere to espoused standard of racial justice as well as ensuring that libraries operate in a state of advocacy of racial justice (emic) according to their own sets of professional values. The generation of data from studies informed by an antiracist framework produces knowledge from an emic perspective because of the deliberate inclusion of insiders as well as “experts.” Much of the research data generated about the social world that is available to AI systems are derived from the etic perspective. The nature of data produced from largely an etic perspective has the potential to produce negative consequences because of the uncertainty that is introduced into AI systems.

CONCLUSION

The implications of something as simple as a conceptualization the term, ‘racial justice’ reveals the potential for bias in machine learning and AI. More data gathered using an antiracist framework is needed to improve AI systems and models. Scholars should generate significantly more research data about the social life of communities that embrace and embody an antiracist framework in order to mitigate racial bias in AI applications. Data combining both the emic and etic perspectives and gathered through action research and other collaborative research methodologies have the potential to enrich and expand the capacity of AI to support and determine less biased decisions for society.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author: conceptualization, methodology, investigation, formal analysis, writing – original draft, writing – review and editing; Second Author: conceptualization, investigation, writing – review and editing, project administration; Third Author: data curation, Fourth Author: data curation.

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In the Weeds: Entity Detection for Plant Based Foods

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ABSTRACT
Funding for nutrition research in the United States is less than 5% of the National Institutes of Health budget, so nutrition researchers often turn to published work. This provides an ideal environment for text mining, where entity detection is the task of finding food mentions in text and entity linking connects each food expression to a specific food. For example, the system should harmonize the expressions *soybean*, *soy bean*, *soya bean* and the scientific name *Glycine max (L) Merrill* along with their plural forms to a single concept soybean. However, the system must not harmonize *soybean* with *soy sprouts* because these different forms of soya foods have very different nutritional profiles. Despite the numerous food ontologies available, our work on developing a gold standard for food entities revealed a unique set of challenges that would limit the utility of automated extraction for nutrition researchers.

KEYWORDS
Nutrition, Entity Detection, Entity Linking, Natural Language Processing, Large Language Models

INTRODUCTION
The budget for nutrition research is less than 5% of the annual National Institutes of Health budget (Majmudar 2024), so researchers must rely on previously published results even though food can play a critical role in human health. Many ontologies have been constructed for food including FoodEx (Huybrechts, Nicolas et al. 2025) and FoodOn (Dooley, Griffiths et al. 2018), which were created to increase global food traceability, quality control and data integration. There have also been efforts to harmonize food ontologies (ONS (Vitali, Lombardo et al. 2018)) connect high level foods (FoodWikiFood Ontology Knowledge Base (FOKB) (Celik 2015)), organize food and agriculture for the United Nations (ARGROVOC (Caracciolo, Morshed et al. 2011)) and enable web capability for food safety (FNS-Cloud (Emara, Seljak et al. 2022)).

Our goal is to develop automated systems that capture information about foods that contain phytoestrogens, a substance that mirrors estrogen, which has been associated with both positive and negative health impacts (Patisaul 2017). The project has been strongly influenced by a paper that reports the level of each chemical including isoflavones (e.g. genistein, and daidzein), lignans and coumestan for 79 distinct commonly consumed foods (Thompson, Boucher et al. 2006). As shown in Table 1, the specific food can greatly change the level of phytoestrogens where ¼ cup of soybean sprouts contains only 113µg of genistein whereas ¼ cup of soybeans contains 19,453µg; thus, the system must distinguish between the type of food being studied.

	Per 100g		Per serving size			Proc-
Food	Genistein	Daidzein	Serving	Genistein	Daidzein	essing
soybeans	44,213.4	56,621.4	1/4 cup	19,453.9	24,913.4	low
soy milk	1,852.2	921.3	8.5oz	4,649.1	2,312.3	medium
soybean sprouts	514.6	268.3	1/4 cup	113.2	59.0	low
soy sauce	100.6	23.2	1 tbsp	17.1	4.0	high

Table 1. The level of endocrine disrupting chemicals for soy foods.

From a computational perspective entity detection is the task of identifying food from scientific and connecting each food expression to a specific food, such as those shown in Table 1 is called entity linking. For example, the system should harmonize the expressions *soybean*, *soy bean*, *soya bean* and *Glycine max* along with their plural forms to the concept soybean. Entity linking is critical to enable accurate the comparisons of potential endocrine disruptors across studies. The computational system must also identify and harmonize the amount of food, but as that task is trivial so our work has focused on the more difficult task of detecting and linking food entities. Ultimately our goal is to automate the extraction of these entities, but here we focus on how – despite the numerous food ontologies available – the task of constructing a gold standard that captures the level of specificity required to reflect the level of endocrine disruption presents unique challenges.

METHOD
A knowledge-based (KB) approach to entity detection operates by aligning terms from an existing ontology with phrases in a corpus of text. Unlike approaches that use Large Language Models (LLMs) a KB approach combines both entity detection and entity linking in one step (i.e. if the term is found the concept identifier is immediately available). The KB approach is also deterministic, so that if a food expression is in the ontology, then all mentions of the term are detected and unlike a LLMs, the KB approach does not "hallucinate" (identify a concept that does not

exist in the text). However, a KB approach is more brittle than LLMs because if the exact words do not match perfectly then food expressions will be missed resulting in lower recall.

In this project our goal is to link the scientific literature to the 79 distinct foods described in (Thompson, Boucher et al. 2006), which reports the level of chemicals known to impact the endocrine system. To construct the corpus, foods with multiple ingredients were removed or reduced to the ingredient that contributes most significantly to their nutritional profiles such as wheat in breads. Scientific names were also added to increase the recall from PubMed. In cases where there are multiple scientific names, the name of the core ingredient or the most popular species was used. The number of PubMed abstracts ranged from 28 to 256,943 (abstracts for the food "date" were removed because this term often refers to the time frame of a study). Noun phrases were collected from the dependency grammar for each of the 503,431 abstracts using the Stanza dependency grammar (Qi, Zhang et al. 2020) (Zhang, Zhang et al. 2021).

BRAT (Stenetorp, Topić et al. 2011) was used to annotate 430 soy abstracts that include at least 1 mentions of soy (or a synonym), 1 mention of an endocrine disruptor (or abbreviation), for abstracts with between 4 and 16 sentences. Three undergraduate students in nutrition and nutrition related programs used the scheme shown in Figure 1 to annotate for a semester.

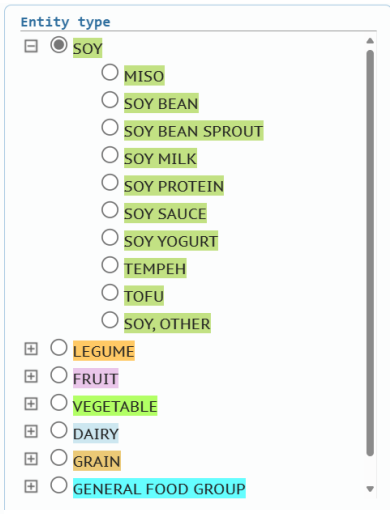

Figure 1. Food Types in the BRAT system for annotators

RESULTS AND DISCUSSION

The most frequently annotated terms in the soy sample are shown in Table 2, where a multi-pass process was needed to ensure consistent annotations with the level of detail needed to align with foods in Thompson *et. al.* 2019.

Food	Abs	Mentions	Food	Abs	Mentions
soy_bean	214	1,259	legume	11	22
soy-other	167	1,180	corn	10	56
soy	90	319	legume-other	7	14
soy_protein	88	485	grain-other	6	20
general_food	36	158	dairy-milk	6	18
dairy-other	24	80	soy_sauce	5	74
soy_milk	17	151	dairy	5	16
general_food	15	66	grain-wheat	5	7

Table 2. The level of endocrine disrupting chemicals for soy foods.

Aligning food mentions from the literature with concepts in the Tompson paper presents a variety of challenges. For example, earlier experiments using the Unified Medical Language System (Bodenreider 2004) revealed that the system could successfully detect all words in the phrase "orange blossom honey", but the meaning of that phrase – i.e. honey produced from orange blossoms – is quite different from identifying the three separate concepts orange (a fruit), blossom (a flower), and honey (a food). Using the noun phrase as a unit of analysis can help to identify misalignments between the text and an ontology that would otherwise go unnoticed.

The punctuation usage in scientific names (e.g. *Glycine Max (L.) Merr.)* differs from regular language, which can lead to errors in noun phrase detection. The scientific name for lentils (*Lens Culinaris*) also proved problematic as the phrase was used to describe lentils, but *Lens culinaris agglutinin* (LCA), is a protein used in various applications and *Lens culinaris agglutinin-reactive fraction* (AFP-L3) is used to measure the binding of certain sugar residues on the AFP protein. Again, this suggests that using the noun phrase as a unit of analysis would reveal cases where the scientific name is not sufficient to accurately detect a food entity. Although the corpus was constructed using PubMed that focuses on biomedical literature, several agricultural studies where included, thus using the ontology approach would have incorrectly identified *soybean cyst nematode*, which is a pest and not a food group.

CONCLUSION

Annotating foods at the level of specificity needed to detect an accurate level of phytoestrogen potential requires advances with respect to entity linking. In this poster we report the annotation results of a pilot study with 430 soy abstracts and experiences from this project study will inform the next round of manual annotations. The results thus far suggest that using noun phrases as a unit of analysis could help detect otherwise misaligned terms. Ultimately the annotations, and the accompanying automated system will aid nutrition researchers.

GENERATIVE AI USE

We confirm that generative AI was not used in writing this manuscript.

AUTHOR ATTRIBUTION

Conceptualization CB & ZME, Data curation & RW & CB, Software CB & RW, Writing – original draft CB & RW, Writing – review & editing, RW & ZME

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Testing AI in Law: Inconsistencies, Limitations, and the Need for Human Oversight

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ABSTRACT

The intersection of technology and the legal profession has evolved significantly, with legal practitioners using tools like Westlaw, LexisNexis, and Google Search for legal research. More recently, artificial intelligence (AI) tools, such as ChatGPT, have been integrated into legal practice, offering both promise and challenges. In particular, incidents like the *Mata v. Avianca* case, where attorneys faced sanctions for submitting fictitious citations generated by ChatGPT, highlight the risks of relying on AI in legal work. While courts have issued guidelines for the responsible use of AI, there remains a clear need for due diligence and a thorough understanding of its limitations. This study evaluates the effectiveness of AI tools in legal research by presenting two complex legal questions, one involving U.S. asylum law and the other concerning Colombian legal principles. The responses from ChatGPT and Google's AI were analyzed for accuracy and consistency, revealing significant gaps in both tools' performance, particularly in providing complete and current legal information. While they can assist in research, they are not yet reliable enough to replace expert legal analysis. The findings suggest that legal professionals should approach AI-generated legal information with caution and verify results with human expertise.

KEYWORDS

Legal Research, ChatGPT, AI, Legal Information, Accuracy and Reliability

INTRODUCTION

The intersection of technology and the legal profession is not a recent phenomenon. For decades, U.S. legal practitioners have relied on specialized databases such as Westlaw and LexisNexis to conduct legal research (Hall, 2012). When it comes to international legal inquiries, tools like Google Search have also been employed to gather information about foreign legal systems. However, the rapid evolution of technology, and the emergence of artificial intelligence tools like ChatGPT among others, has introduced new dynamics to the legal field (Kabir, 2023).

In recent years, the legal community has witnessed both the potential and the pitfalls of integrating AI into legal practice. Notably, in the case of *Mata v. Avianca*, attorneys were sanctioned for submitting court filings that included fictitious case citations generated by ChatGPT (S.D.N.Y. 2023). Incidents like these have prompted some courts and legal associations to issue guidelines on the responsible use of AI in legal contexts (Conley, 2024). Rather than banning such tools, these guidelines promote their use, provided it is done with due diligence and a clear understanding of their limitations (Marchant, 2024).

As AI becomes increasingly prevalent, legal professionals, judges, lawyers, and alike, should not only remain informed about technological advancements but also critically assess their reliability and appropriate applications (Conley, 2024). This poster explores the promise and challenges of using AI in legal research, using a real-life case study to illustrate how such tools impact the quality and integrity of legal information.

METHODOLOGY

To assess the reliability of AI tools in conducting legal research, this study posed two targeted legal questions, one about U.S. law and other Colombian law to both ChatGPT and Google Generative AI. Each question was selected for its complexity and the need for subject-matter expertise, thereby requiring a thorough and accurate understanding of relevant legal frameworks. These questions were designed to test the AI tools' ability to retrieve and synthesize information that would typically demand a rigorous, traditional legal research process. The questions presented were as follows:

1. Which U.S. Federal Judicial Circuits do not apply the 'social visibility' and 'particularity' criteria when analyzing claims based on membership in a Particular Social Group (PSG) in asylum cases?
2. Does Colombia follow a system of mandatory legal precedent or adhere to the principle of stare decisis?

The first question aimed to evaluate AI performance in the context of U.S. legal research, specifically within the complex field of asylum law. In this area of law, courts must determine whether an applicant qualifies as a member of a Particular Social Group (PSG), one of the protected grounds for asylum. To make this determination, almost all U.S. Federal Judicial Circuits apply the "social visibility" and "particularity" tests. As of this writing, the Seventh Circuit is the only circuit that explicitly rejects both tests. This question was designed to assess the AI's ability to navigate complex and evolving legal standards.

The second question was included to assess the AI's ability to engage with a different type of legal system. Colombia has traditionally been classified as a civil law country, in contrast to common law jurisdictions like the

United States, where judicial precedent from higher courts is binding under the doctrine of stare decisis. However, Colombia has gradually incorporated the concept of binding judicial precedent, particularly through the decisions of its Constitutional Court, which now functions in a manner similar to the U.S. system of stare decisis.

Each of the two questions was submitted to ChatGPT and Google Generative AI under the same conditions. To test the consistency of the tools, the queries were repeated on a separate computer six hours later, allowing for comparison of the responses to determine whether the results remained consistent or varied over time. Two licensed attorneys, experts in U.S. immigration law and Colombian law, reviewed the AI-generated responses to assess their accuracy and reliability.

RESULTS

First Question: Which U.S. Federal Judicial Circuits do not apply the 'social visibility' and 'particularity' criteria when analyzing claims based on membership in a Particular Social Group (PSG) in asylum cases? Google's AI provided a partially correct answer, correctly identifying that the 7th Circuit does not apply the test, but erroneously included the 3rd Circuit, which does apply the tests. ChatGPT, however, failed to mention the 7th Circuit altogether, instead referencing circuits that do apply the test, such as the 9th and 5th Circuits. When the question was repeated after six hours, ChatGPT gave a more accurate response, identifying the 7th and 3rd Circuits, similar to Google's AI. While this answer was closer to being correct, it still remained incomplete, as only the 7th Circuit currently does not apply the test. The surprising change in ChatGPT's response over the short interval suggests that the AI's answers can be influenced by minor shifts in query input or processing, though the final answer was still not fully accurate.

Second Question: Does Colombia follow a system of mandatory legal precedent or adhere to the principle of stare decisis? Google's AI did not provide a definitive answer, and the excerpt it selected was inaccurate, incorrectly stating that civil law countries do not follow stare decisis. In contrast, ChatGPT offered a more accurate response, explaining that Colombia operates under a hybrid model where, in recent years, rulings from high courts, particularly the Constitutional Court, have had binding authority over lower courts. While ChatGPT's response was generally acceptable, it lacked precision regarding the specific cases in which such rulings are binding. Based on this, ChatGPT's response could be graded as a B. When the question was repeated after six hours on a different computer, both AI tools provided the same answers, confirming the consistency of their responses.

CONCLUSION

AI tools are advancing rapidly, but a significant gap remains before they can be considered fully reliable in the legal field. This case study, which involved two complex legal questions, revealed that AI-generated responses were often incomplete or outdated, underscoring the continued need for human oversight.

Google's AI outperformed ChatGPT on the first question by correctly identifying that the Seventh Circuit does not apply the "social visibility" and "particularity" tests in U.S. asylum law. However, it failed to note that the Third Circuit currently does apply them. In contrast, ChatGPT provided a stronger response on Colombian law, correctly identifying Colombia as a hybrid legal system. Still, it did not explain how the stare decisis functions in the country.

These findings highlight a core limitation. AI systems pull information from a wide range of sources, including outdated or inconsistent information. In the legal field, this poses a serious challenge. For AI tools to become reliable, they require continuous legal updates and training to apply legal reasoning accurately and contextually.

Until AI achieves that level of precision, legal professionals should use AI tools with caution and verify their outputs with qualified experts. While AI may not yet provide fully reliable legal research, it holds considerable promise for efficiently processing and navigating large volumes of legal material.

GENERATIVE AI USE

I employed AI tools for the following purpose: to pose specific questions to the systems and assess the accuracy of their responses. The author assumes full responsibility for the content presented in this submission.

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Securing Second Sales: An Analysis of the Content of Manufacturers and Platforms on Privacy in the Secondary Market for Smart Home IoT Devices

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ABSTRACT
Smart home Internet of Things (IoT) devices are household technologies embedded with network connectivity and are increasingly traded in second-hand markets, including online resale platforms and physical thrift outlets. However, the resale of these devices introduces significant privacy risks, especially when the manufacturer-provided instructions for secure data transfer and reset are unclear or insufficient. This study conducts a qualitative content analysis of publicly available documentation, including user manuals, support pages, and websites from major IoT manufacturers, to evaluate how effectively manufacturers communicate privacy risks to consumers. The findings offer valuable insights for improving user trust, supporting responsible IoT consumption in second-hand markets, and guiding manufacturers in developing clearer, privacy-conscious communication strategies.

KEYWORDS
Second-hand smart home, IoT privacy, Risk Communication Theory, Manufacturer guidance, Data security, Content analysis

INTRODUCTION
Rapid expansion of the Internet of Things (IoT) has transformed conventional household appliances into interconnected smart devices, enabling real-time monitoring, automation, and data-driven control (Atzori et al., 2010; Weber, 2010). As smart home adoption becomes more widespread, the resale of pre-owned devices has grown in parallel, facilitated by online platforms such as eBay and Facebook Marketplace, local classified listings, and second-hand retail outlets (Statista, 2023). This market is driven by affordability, technological turnover, environmental consciousness, and increasing consumer demand for sustainable options (Seenaswamy, 2024). IoT devices often retain sensitive personal data, account information, and configurations from previous owners. If these are not fully reset or securely transferred, new owners may inherit devices still linked to past users, exposing both parties to potential security breaches (Roman et al., 2011; Choffnes et al., 2023). However, studies suggest that such guidance is often inconsistent, incomplete, or overly technical, leaving users vulnerable and uninformed. This study addresses this gap by examining how major smart home manufacturers communicate the risks and processes involved in the safe resale of IoT devices. Through a content analysis of publicly available materials, including user manuals, product websites, and technical support documents, this research investigates the clarity, accessibility, and effectiveness of privacy-related messaging targeted at consumers in the second-hand smart device market.

THEORETICAL FRAMEWORK
This study is informed by the Risk Communication Theory, which explores how information about potential hazards is communicated to the public to promote awareness, informed decision-making, and protective action (Slovic, 1987; Fischhoff et al., 1981). In the context of this study, risk pertains to personal data exposure during the resale and transfer of smart home IoT devices. This theoretical lens supports a structured analysis of how consumer-facing documentation frames privacy risks and facilitates the responsible reuse of smart home technologies. The theory emphasizes five key principles.

Principle	Operationalization in this Study
Message clarity and completeness	Assessing whether instructions explicitly describe risks and offer detailed transfer/reset procedures.
Audience consideration	Evaluating whether guidance is understandable to typical, non-technical consumers.
Transparency and openness	Examining whether manufacturers disclose potential privacy vulnerabilities during device transfer.
Actionability of information	Determining whether manufacturers provide specific, easy-to-follow steps for safe device reuse.
Framing of message	Analyzing how manufacturers convey the importance and consequences of secure transfer procedures.

Table 1. Operationalization of risk communication theory principles in this study

METHODOLOGY

This study uses a qualitative content analysis of 32 documents curated from publicly available manufacturer sources, including user manuals, setup instructions, FAQs, and reset guides from brands such as Amazon, Google Nest, Arlo, and Kwikset. Document selection focused on devices commonly found on resale markets, such as smart locks, speakers, cameras, lighting, and thermostats. The dataset was curated through systematic searches of manufacturer websites using keywords such as device transfer, account disconnection, and account reset. Each author independently applied keyword-based heuristics (e.g., clear instructions, warns of consequences) to translate qualitative language into numeric scores. A preliminary codebook was developed through initial review and refined iteratively. The coding framework incorporated five principles from Risk Communication Theory: message clarity, audience consideration, transparency, actionability, and risk framing. Each document was assessed on a 0 to 2 ordinal scale, where 0 indicated absence, 1 partial presence, and 2 full presence. Differences in code application were reviewed and resolved collaboratively to ensure consistency.

RESULTS AND ANALYSIS

The findings revealed that actionability and message clarity appeared most frequently, indicating a moderate effort to guide users through the reset procedures. However, transparency was limited, with few manufacturers openly disclosing the privacy risks of improper transfers. Audience consideration was notably weak, as most guidance assumed technical expertise. Framing, which involves articulating potential consequences, was largely absent. Only a small number of documents comprehensively addressed more than three principles. These findings suggest considerable communication gaps that may leave second-hand users exposed to privacy risks. The pie chart illustrates the relative emphasis on five core principles based on the content analysis of publicly available guidance materials

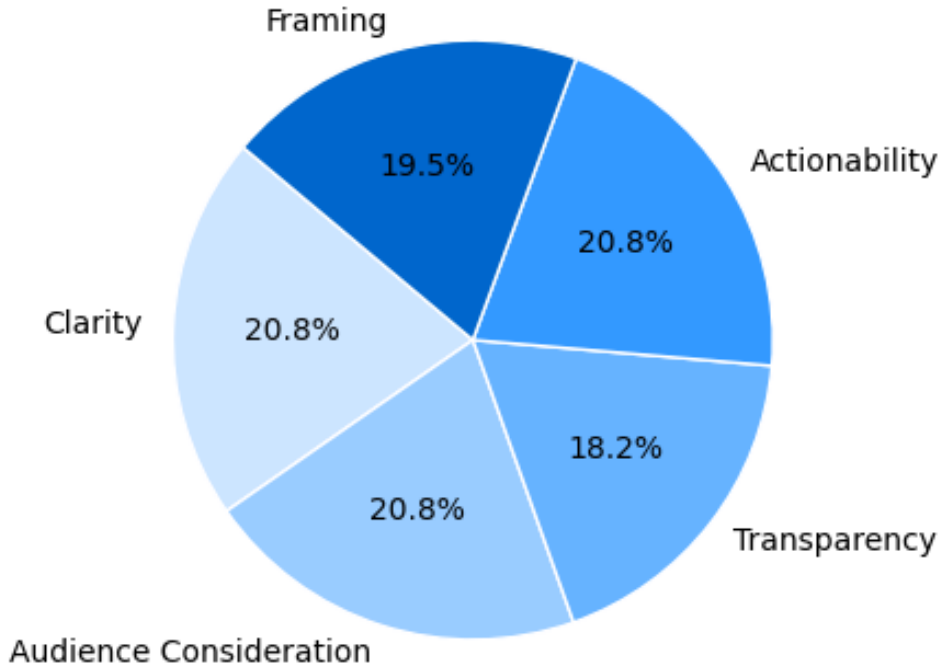

Figure 1. Proportional distribution of Risk Communication Theory principles across smart home IoT manufacturer documents.

CONCLUSION AND FUTURE WORK

Findings reveal substantial inconsistencies in the quality of privacy-related instructions across different manufacturers. Some brands provided clear and actionable guidance for secure device transfer, while others omitted critical steps or relied on overly technical language that may be inaccessible to typical consumers. These gaps undermine consumer confidence and increase privacy risks in the second-hand smart home market. This study also lays the foundation for future work on standardizing data sanitization protocols and enhancing information policies for second-hand digital products.

AUTHOR ATTRIBUTION

Mildred Adwubi Bonsu: conceptualization; methodology, data curation, formal analysis, investigation; writing – original draft preparation; writing – review & editing. Benjamin Yankson: formal analysis, methodology, supervision, validation; writing – review & editing

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

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Medical Doctors' Perceptions of Generative AI Across the United States: A Sentiment Analysis of X Posts

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ABSTRACT
Artificial Intelligence (AI) rapidly expands in healthcare, yet little is known about how medical professionals perceive this transformation. We analyzed 7,136 tweets about AI posted by medical doctors between November 2022 and March 2025. Results show attitudes of medical doctors about AI are statistically different across the U.S. divisions (χ^2 (16) = 82.53, p <.001), with more favorable sentiment observed in the Pacific and New England divisions, and more negative sentiment in the South Atlantic division. Understanding these differences highlights geographic factors influencing AI acceptance, guiding responsible AI adoption in healthcare.

KEYWORDS
Generative AI; Physicians; Sentiment analysis; Social media (X/Twitter); Geographic variation; U.S. Census divisions; Health informatics; Healthcare

INTRODUCTION
Artificial Intelligence (AI) is growing in various areas, including education, business, and health and medical settings (Shuaib, 2024). While AI can bring benefits, it could cause challenges (Mohammadi et al., 2025), which are important to be considered in healthcare (Chettri et al., 2025). Understanding how healthcare professionals, particularly medical doctors, perceive and discuss AI can provide insights that can be used for responsible AI development and adoption (Aqeel et al., 2025; Pawar et al., 2020; Pifarre-Esquerda et al., 2025). There are some optimistic discussions about the advantages (Shinners et al., 2023) of AI in healthcare, such as diagnostics, telemedicine (Sonawane et al., 2023), decision-making and resource allocation (Petersson et al., 2023), but there are some concerns about legal risks and job displacement among healthcare professionals (Sahoo et al., 2025). As a result, studying how AI is perceived and adopted in healthcare is essential to ensure its implementation is both effective and ethically responsible.

Social media is a rich source to capture opinions across diverse geographic areas in different professional areas (Chen et al., 2022). Medical doctors use social media for different purposes, such as sharing their thoughts about new technologies in healthcare and clinical environments (Khan et al., 2021; Law et al., 2021). X (Twitter) data has been used to find perceptions and sentiments on areas such as health (Hu et al., 2021) and AI (Borji, 2025; Mamo et al., 2024; Smith-Mutegi et al., 2025). However, there is a lack of systematic research on the attitude of medical doctors related to AI using social media data, although some related studies have used survey and interview data (Aqeel et al., 2025). Therefore, this study fills that gap by analyzing X posts from U.S.-based medical doctors to find regional differences in sentiment toward AI in healthcare.

METHOD
Quid Monitor is a social media data aggregator for various platforms, such as X, and provides enriched data, such as geography and the users' bios, based on public data. Using Quid Monitor, we employed 34 Generative AI-related keywords (e.g., ChatGPT, large language model), filtering based on user bios containing 80 detailed specialist titles (e.g., cardiologist, surgeon) to retrieve content authored or reposted by medical doctors about Generative AI. The dataset spans from November 2022 (when ChatGPT and generative AI were publicly accessible) to March 2025. To verify data quality, we manually inspected 100 randomly selected profiles using stratified sampling. The final dataset contained 7,136 tweets. These tweets were grouped based on the nine Census Divisions of the United States (2023): Pacific (N = 1548), Middle Atlantic (N = 1323), South Atlantic (N = 1289), New England (N = 961), East North Central (N = 568), West South Central (N = 565), Mountain (N = 353), West North Central (N = 326), and East South Central (N = 203). Sentiment analysis was conducted using TextBlob, a Python library that provides a simple API for natural language processing tasks such as sentiment analysis (Deitel & M. Deitel, 2020; Sarkar, 2019). A sample of 100 tweets showed strong agreement between TextBlob sentiment analysis and human judgment. Tweets scoring polarity > 0.05 were labeled positive, < –0.05 negative, and –0.05 to 0.05 neutral. In the next step, a chi-square test of independence was applied to evaluate whether the distribution of sentiments statistically differed by division; all expected cell frequencies exceeded five after pooling, satisfying test assumptions. Then, pairwise chi-square tests were conducted for all 36 combinations using the Bonferroni method. All analyses were performed in Python 3.10, employing the Pandas library for data management, the Plotly library for visualization, and SciPy for chi-square calculations. All the research materials, including the search query for

data collection and contingency table, are deposited in Figshare and are publicly accessible at https://figshare.com/s/7b447d2b2198807139f6.

RESULT

Figure 1 visually represents the positive (marked in green) and negative (marked in red) distribution of sentiments. Pacific, New England, and the West North Central divisions share the highest positive sentiments. Whereas East South Central and West South Central have the highest rate of negative sentiments.

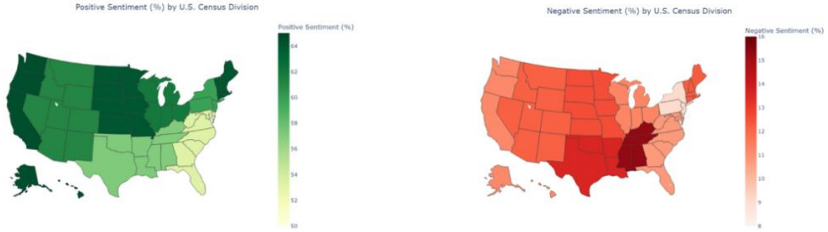

Figure 1. Distribution of Medical Doctors' Sentiments on AI in the U.S.

Figure 2 illustrates stacked proportions across the divisions. Positive sentiment predominated (4,310 tweets; 60.4%), followed by neutral (2,020; 28.3%) and negative (806; 11.3%) content.

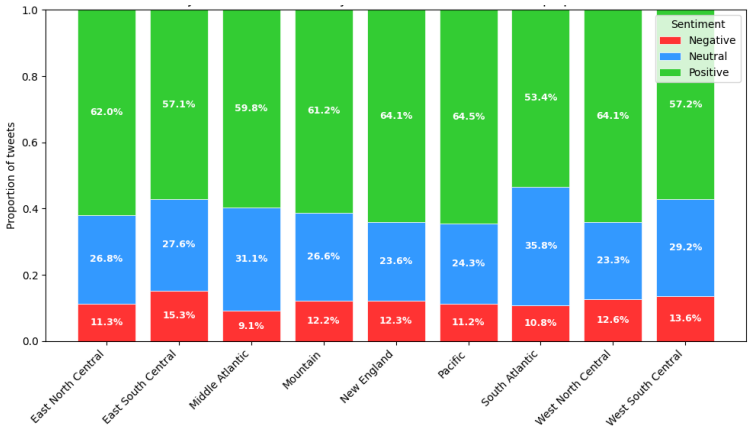

Figure 2. Physicians' AI Sentiment by U.S. Census Division (stacked proportions)

A χ^2 test of independence demonstrated that the distribution of sentiments differed by division, χ^2 (16) = 82.53, $p < .001$. The strength of this association, as indexed by Cramer's V, was 0.08, indicating a small effect according to Cohen's (1988) benchmarks for three-category tables. Bonferroni adjustment ($\alpha/36 \approx .0014$) retained six pairs with differences. The largest disparities involved the South Atlantic compared with the Pacific ($V = 0.13$, $p < .001$) and New England ($V = 0.13$, $p < .001$) divisions, both of which exhibited markedly higher shares of positive and lower shares of neutral tweets. Smaller differences were observed between the Middle Atlantic and New England ($V = 0.09$), South Atlantic and West North Central ($V = 0.11$), Middle Atlantic and Pacific ($V = 0.08$), and South Atlantic and East North Central ($V = 0.09$). All effect sizes remained within the small range ($0.08 \leq V \leq 0.13$), underscoring that regional sentiment differences were modest in practical terms.

DISCUSSION AND CONCLUSION

U.S. doctors speak about generative AI largely in favorable terms, but that enthusiasm is not consistent across divisions. The Pacific and New England divisions, home to major technology hubs and large academic and medical centers, expressed the highest positivity, confirming prior survey work linking resource availability to AI optimism (Petersson et al., 2023; Sonawane et al., 2023). By contrast, the South Atlantic had the lowest share of positive and the highest portion of neutral content. Although the overall effect size was small, the South Atlantic's repeated appearance in five of the six significant pairwise gaps. Possible anecdotal drivers include lower AI training opportunities, differing malpractice climates, or a higher proportion of community hospitals, all factors previously tied to slower technology (DesRoches et al., 2012) and AI uptake (Shinners et al., 2023; Choudhury & Asan, 2022). These findings can be used by healthcare policymakers and AI developers to frame localized adoption and training. In this study, only users who self-identified as U.S. states were retained, biasing the sample toward physicians comfortable sharing location data. Although the tweet counts differed across divisions, the chi-square remains robust to unequal group sizes as long as the expected cell count is at least five (McHugh, 2013). Future work could explore medical doctors' sentiment on a specific aspect of AI in healthcare, such as personalized treatment.

GENERATIVE AI USE

Generative AI was used to edit this document for more language clarity and delivery.

AUTHOR ATTRIBUTION

Samaneh Borji: Data Curation (lead); Formal Analysis (equal); Methodology (equal); Visualization (equal); Writing – Original Draft (lead); Writing – Review and Editing (equal). Ehsan Mohammadi: Conceptualization (lead); Methodology (equal); Supervision (lead); Writing – Review and Editing (equal). Amirreza Kalantari: Formal Analysis (equal); Visualization (equal); Writing – Review and Editing (supporting).

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Digital Health Information Access for LGBTQIA+ Communities: A Content Analysis of Community and Institutional Guides

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ABSTRACT
LGBTQIA+ individuals face challenges in accessing affirming health information, including stigma, lack of culturally competent care, and digital resource availability. Resources created by communities and institutions can provide LGBTQIA+ audiences with this information, yet limited research has explored their scope and topics. This study examines the characteristics, subjects, accessibility, and inclusivity of 217 U.S. based LGBTQIA+-focused online health resources. We identified these resources using Google and analyzed them using content analysis. Findings denote that while online LGBTQIA+ health resources broadly support mental health, crisis intervention, and transgender care, the latter often emphasize national resources over localized coverage. Resources minimally represented LGBTQIA+ groups like intersex and bisexual people as well as those with diverse intersectional identities. Further, accessibility and privacy features like escape mode and screen reader capabilities were largely absent. Relevant stakeholders, like information professionals, healthcare providers, and LGBTQIA+ organizations, can use findings to recognize gaps in online LGBTQIA+ health information networks and inspire resource creation.

KEYWORDS
LGBTQIA+ health information; intersectionality; content analysis; digital consumer health guides

BACKGROUND AND LITERATURE REVIEW
LGBTQIA+ individuals often encounter barriers to accessing affirming health information, including stigma, lack of culturally competent care, and healthcare costs (Cassidy et al., 2023; Medina-Martínez et al., 2021). These challenges, combined with the diversity of health needs across race, gender, and sexual orientation, contribute to a lack of trust in healthcare providers (Noh et al., 2025). Consequently, many LGBTQIA+ people turn to the Internet, where community- and institution-created resources play a critical role in providing accessible information (Jonas et al., 2024). However, research on these digital resources remains limited, with existing studies often focusing narrowly on college websites or specific subgroups. As online resources risk removal due to political and funding challenges (Reed, 2025), it is crucial to understand the current landscape of community- and institution-produced online health information for LGBTQIA+ communities. LGBTQIA+ individuals face significant barriers to accessing affirming health information, including stigma, inadequate provider knowledge, and structural barriers such as limited insurance coverage (Brooks et al., 2018; Safer et al., 2016). These challenges often lead individuals to seek health information online, where they can find support for both sexual health (e.g., HIV/STIs, identity) and nonsexual health (e.g., mental health, chronic conditions) (Jia et al., 2022).

However, online communities are also sites of risk, with users encountering misinformation and hate speech (Delmonaco & Haimson, 2023; Leong et al., 2025). Intersectional factors like race, age, and disability compound these challenges, creating additional barriers to accessing inclusive and reliable health information (Conyers et al., 2023). Community-driven efforts, such as zines, hotlines, and localized online resources, have emerged as critical support, yet they often lack sustained funding and remain vulnerable to political shifts (Jonas et al., 2024). Libraries and information professionals play an increasingly important role in filling information gaps by developing inclusive, community-collaborative health guides, although many still lack intersectional representation and accessibility features (Morris & Roberto, 2016; Stevens & Fajardo, 2021). Despite these efforts, few studies examine the landscape of LGBTQIA+-focused online health resources. This study addresses this gap by analyzing their subjects, accessibility, and inclusivity of 217 such resources in the U.S.

METHODS
In September 2024, we searched Google using state-specific and national LGBTQIA+ health terms: *[individual state] LGBT; [individual state] LGBTQIA; [individual state] Queer; LGBT Health Information Resources; LGBTQIA Health Information; LGBTQIA Health Consumer Information*. From this search process we reviewed the first ten pages of results of each term (over 5,500 results) to capture prominent and lesser-known websites, which were referred to as resources, including those from smaller creators. We stopped after the first ten pages for practical reasons, due to the number of results available through the first ten pages. Incognito mode was not used because we aimed to conduct a standard search and wanted to avoid limiting the results. We included resources if they focused

on LGBTQIA+ health and were freely accessible, excluding social media sites and forums. From the exclusion process we eliminated 5,283 websites that did not meet our criteria.

We archived all relevant links via the Internet Archive. Guided by prior research, we conducted content analysis (Drisko & Maschi, 2016) by reviewing each resource's descriptions and website metadata—without clicking through to the linked resources—to avoid capturing unrelated or dynamic content. We developed a structured codebook with four main categories: information characteristics, subjects, accessibility, and inclusivity. To ensure reliability, we completed inter-coder reliability to the first 20% of the dataset, discussed discrepancies, and refined the codebook before proceeding with coding the remaining resources. We cleaned the data and used Excel pivot tables to generate descriptive statistics. Limitations include Google's personalized search algorithm (partially mitigated by extending searches to the tenth page), capturing only resources available through March 2025, and excluding private community-created resources.

FINDINGS AND DISCUSSION

We analyzed 217 LGBTQIA+ focused online health resources in the U.S. Most resources (95%) targeted the general public, with additional audiences including professionals (47%) and students (42%). Regional disparities were evident, with California being the most represented and the Southwest significantly underrepresented. Topics frequently covered included mental health (71%), crisis support (36%), and HIV/AIDS (43%), while issues like chronic conditions, eating disorders, and reproductive health were underrepresented. Accessibility features were limited, only; 15% of resources offered assistive technologies, 8% were multilingual, and just 3% included escape buttons for safe browsing. Representation of LGBTQIA+ subgroups varied: transgender individuals were most represented (65%), but bisexual, intersex, asexual, and nonbinary groups were each included in fewer than 20% of resources. Demographic representation favored youth (50%), with fewer resources focusing on older adults, people of color, individuals with disabilities, and other marginalized groups. These findings highlight ongoing gaps in inclusivity and accessibility, as well as a lack of intersectional perspectives.

While grassroots and community-based efforts play a critical role in filling information gaps, they often lack stable funding and are vulnerable to sociopolitical shifts. National organizations tended to dominate, overshadowing local initiatives and reinforcing a narrow view of LGBTQIA+ health needs. By national organizations stronger presence, they limit individuals from finding culturally specific, community-driven, and regionally relevant information. To address these challenges, libraries and institutions should collaborate with LGBTQIA+ communities to develop inclusive, sustainable, and accessible digital health guides. Priorities should include integrating assistive technologies, multilingual content, and features that protect user privacy, alongside investments in long-term maintenance and community partnerships.

CONCLUSION

Findings reveal significant gaps in online LGBTQIA+ health resources, particularly in inclusivity, accessibility, and sustainability. Libraries, information professionals, and community health workers should collaborate to develop guides that promote marginalized identities, incorporate accessibility features, and secure sustainable support. A national repository of LGBTQIA+ health resources could help preserve critical information in challenging sociopolitical climates.

GENERATIVE AI USE

We utilized Grammarly for grammar checking and to help with the overall flow of the paper, and ChatGPT for ideas about transition sentences and to point out redundancies and gaps in the paper. We reviewed all outputs by Grammarly and ChatGPT before accepting suggestions or changes. All authors assume full responsibility for the submitted content.

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Some references were redacted due to the author's participation in referenced work.

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A Systematic Review of Interactivity in Game-Based Learning with AI

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ABSTRACT
Game-based learning (GBL) represents a promising avenue for improving student learning outcomes by providing immersive, engaging, and interactive experiences for learners. However, there is a lack of comprehensive understanding regarding how interactivity plays a role in GBL, especially when applied with artificial intelligence (AI). To address this gap, we conducted a preliminary systematic review to explore the effectiveness of game-based learning with AI, specifically focusing on three types of interactions: (1) student-student interaction, (2) student-AI interaction, and (3) adaptive/immersive environments. The primary objective was to identify how researchers in various disciplines incorporated AI into educational games from a human-computer interaction perspective. We investigated empirical articles published between 2022 and 2025 with game interventions in a classroom setting, screened 97 papers, and selected 20 studies for analysis following the PRISMA protocol. Our review identifies the types of games employed and student outcomes based on interaction type.

KEYWORDS
Game-based learning; generative artificial intelligence (GenAI); large language models (LLMs); education.

INTRODUCTION
Game-based learning utilizes digital games and gamification elements to increase student motivation and their desire to learn (Plass et al., 2015). Past research has found that games offer an engaging, interactive, and immersive experience for students, but may lack utility due to their inability to replicate human-like language communication (Lim et al., 2025; Zhao et al., 2024). With the current rise of AI, particularly large language models (LLMs), researchers have mixed views on incorporating it as a potential game-based learning tool. Some find it to improve the immersive experience of digital games, while others caution that it may cause more harm than good in learning (Lim et al., 2025; Mezzaro et al., 2024). Moreover, it remains unclear how effective game-based learning and generative AI are in improving student outcomes. Thus, we seek to investigate the existing studies that integrate AI into educational games with a focus on interactivity, a value which allows learners to experience immediate consequences, and thus promotes involvement, sustained attention, and learning (Ritterfeld et al., 2009). Using the PRISMA framework, our inclusion criteria focused on peer-reviewed empirical research studies published in English between 2022 and 2025 that utilized games and/or AI within an educational context. Refer to Figure 1 for the whole screening process. Three reviewers independently collected and reviewed all articles. The final search was completed on July 22, 2025.

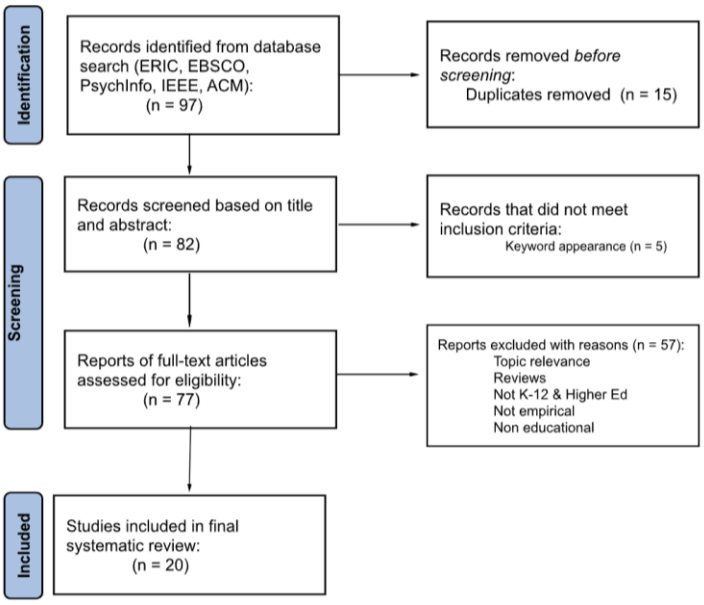

Figure 1. PRISMA Flow Diagram of Study Selection Process

EXPLORED OUTCOMES

Types of Games

In our systematic review, we found that educational gaming research offered diverse approaches ranging from AI-powered interactive learning games where students engage with intelligent non-player characters (NPCs) (Chen & Chang, 2024; Luo et al., 2024; Tsang et al., 2024; Wang et al., 2025; Zhao et al., 2024) to gamified learning management systems that enhance traditional platforms with progress-tracking mechanisms (Kian et al., 2022; Lara-Cabrera et al., 2023; Ng et al., 2023; Reyssier et al., 2022). Immersive virtual environments utilize platforms like Minecraft Education Edition and Roblox for collaborative STEM learning and teacher training simulations (Lim et al., 2025; Rodríguez et al., 2025; Singh & Sun, 2025), while educational mini-games and skill-building applications focus on specific subject mastery through interactive problem-solving (Hou et al., 2024; Mohanarajah & Sritharan, 2022; Srinivasa et al., 2024).

Types of Interactivity

In studies focusing on student-student interactions, learners collaboratively interacted within game-based learning environments with minimal assistance from AI-based agents. These studies focused on understanding how game-based elements could increase motivation using non-traditional pedagogical techniques (Kian et al., 2022; Kim et al., 2024). For instance, Kian et al. (2022) found that gamified classrooms can facilitate self-directed learning by creating scaffolded learning environments that progressively increase in difficulty across game levels. This increase in difficulty improved students' intrinsic motivation to persevere through levels. Several studies emphasized creating collaborative learning environments, where students shared ideas and tackled challenging problems in advanced academic domains, such as blockchain technologies and STEM courses (Kim et al., 2024; Tsang et al., 2024). Additionally, guided collaboration within gamified settings improved knowledge retention, social skills, and engagement (Kim et al., 2024; Kian et al., 2022). Studies from Tsang et al. (2024) and Reyssier et al. (2022) demonstrated structured peer interaction enhancing learning outcomes, while Lara-Cabrera et al. (2023) and Pornpongtechavanich et al. (2023) examined how different gamification approaches influenced peer interaction patterns.

The student-AI interaction studies commonly used LLM-based AI tools for individual learners by incorporating them as a chatbot or learning assistant that promoted interactive tasks. The learning systems included delivering real-time feedback and personalized challenges through games and conversational experiences, which enhanced motivation and increased students' immersion in learning than traditional tools (Dahri et al., 2025; Luo et al., 2024; Ng et al., 2024; Wang et al., 2025). LLM systems that provided follow-up examples especially showed significantly higher learning outcomes compared to game-only and LLM-only environments (Chen & Chang, 2024). However, Mezzaro et al.(2024) found a contrasting trend of smart assistant users performing slightly worse. Together, the studies underscore AI literacy as a critical skill for students to effectively leverage these tools and call for AI educational designs that can induce holistic learning processes involving reflection, reading, and assimilation of information.

Studies categorized as adaptive interaction often incorporated AI-powered NPCs in 1:1 conversational exchanges with adjusted content complexity based on individual learners' live performance data (Lim et al., 2025; Singh & Sun, 2025; Mohanarajah & Sritharan, 2022; Zhao et al., 2024). The immersive gadgets and dynamic agent responsiveness sustained learner engagement and improved learning outcomes. Furthermore, VR and AR enhanced adaptive learning by creating multisensory and context-rich environments that deepened the learning experience. Multimodal immersion scaffolding combined visual, spatial, and conversational elements to support diverse learning preferences. Adaptive virtual agents exhibiting personality-based responses created authentic social learning contexts and guided autonomy mechanisms that maintained learning focus without compromising exploratory engagement (Mohanarajah & Sritharan, 2022; Zhao et al., 2022; Srinivasa et al., 2024).

CONCLUSION

In this study, we conducted a systematic review using the PRISMA framework, identifying 20 recently published peer-reviewed papers that examine game-based learning in the context of AI across multiple databases. Our focus on interactivity, which enables students to explore, make decisions, and receive feedback, contributes to a unifying framework that bridges the research streams of learning methods, platform characteristics, and learner experience factors. Thus, we categorized the interactivity into three types: student-to-student, student-to-AI, and adaptive systems. Results indicate that the majority of interaction types improve learners' information absorption and engagement. Peer interactions additionally demonstrated increased social-emotional skills, and adaptive environments sustained students' focus. However, some students exhibited AI-reliant behaviors in individual interactions with AI tools. As most studies tested learning outcomes as their dependent variable, with engagement levels being highly correlated to learning gains, the results underscore the importance of context-based instruction designs for maximized learning experiences and interactivity as a central criterion for evaluating the quality and effectiveness of AI-supported game-based learning systems.

GENERATIVE AI USE

We employed ChatGPT (OpenAI) to assist with improving language clarity and grammar during the editing phase of this submission. All output was reviewed and revised by the authors.

AUTHOR ATTRIBUTION

Shinhye Cha: conceptualization, methodology, data curation, formal analysis, project administration, writing – original draft; Jennie Lee: conceptualization, methodology, data curation, formal analysis, visualization, project administration, writing – original draft; review and editing; Roman Zapata: conceptualization, methodology, data curation, formal analysis, writing - original draft, writing - review & editing.

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Crafting Effective Metaphors for Science Communication: Insights from Cybersecurity Experts

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ABSTRACT
Explaining cybersecurity concepts to the public is often challenging due to their complexity, leading to the wide use of metaphors, but their effectiveness remains underexplored. Building on prior work identifying eight metaphor categories, this study engaged six cybersecurity experts to evaluate their appropriateness and communicative value. Preliminary findings suggest replacing dominant fear-based metaphors like war and crime with health and risk management frames that better promote public engagement and responsible behavior. Experts also offered guidance on crafting effective metaphors, emphasizing contextual clarity, precision, and relatability. By foregrounding key considerations in metaphor design, this study lays groundwork for building more responsible and accessible cybersecurity knowledge infrastructures, contributing to broader efforts in human-centered science communication

KEYWORDS
Cybesecurity, Metaphor, Science Communication

INTRODUCTION
As cybersecurity becomes increasingly critical, its complexity makes it difficult for the public to understand, prompting efforts to provide accessible knowledge by using metaphors to translate abstract threats into familiar concepts. Nevertheless, their effectiveness remains uneven and under-evaluated (Cains et al., 2021). In a previous study (anonymized for review), we identified eight systematic metaphor categories commonly used to conceptualize cybersecurity. (1) War and (2) crime-related metaphors frame cybersecurity as a battle or policing effort, using terms like *"cyber war"* or *"digital policing."* (3) Fortress metaphors emphasize defense and intrusion prevention, such as *"building a firewall."*(4) Public health and (5) personal health metaphors portray cybersecurity as maintaining digital or individual well-being, with phrases like *"virus prevention"* or *"online hygiene."* (6) Risk management metaphors highlight minimizing threats, likening cybersecurity to *"a safe."* (7) Role-based metaphors use familiar characters like *"navigator"* or *"superman."* Finally, (8) structure metaphors depict cybersecurity as interconnected systems, like a "spider's web" or "pizza," emphasizing interdependence and cohesion. We evaluated these metaphors through a focus group with domain experts to examine their appropriateness, relevance, and effectiveness in communicating cybersecurity concepts. Additionally, expert recommendations were collected for improving metaphor creation and implementation to support clearer, more inclusive science communication.

METHODS
In this study, "expert" refers to individuals with both formal academic and professional backgrounds in cybersecurity, as well as substantial experience in education, public outreach, or professional training. Accordingly, the focus group included six participants: two directors from government cybersecurity agencies, three from cybersecurity certification and training institutions, and one university faculty member specializing in information security.

The focus group was structured based on the Six Thinking Hats framework, a thinking model encouraging participants to examine a topic from multiple perspectives (De Bono, 1999). The session begun with a brief introduction of the eight systematic cybersecurity metaphors previously identified. Participants then engaged in a warm-up discussion on participants' experiences using such metaphors. Following this, the researchers presented metaphor evaluation criteria drawn from science communication literature (Kueffer & Larson, 2014), designed to guide responsible and effective metaphor use. Table 1 listed four criteria, and in our study, only the first three was used, excluding *transparency*, as it pertains more to communicative processes rather than the metaphorical content.

Criteria	Implication
Factual correctness	Metaphors should be consistent with the state of knowledge to the degree of scientific accuracy required in a particular context (e.g., research, popular science writing, science-based decision making).
Socially acceptable	Metaphors that are racist, sexist, or in other ways offensive should be avoided
Neutrality	The metaphor should remain neutral and should not be used to persuade or mislead by expressing the researcher's personal emotions, expectations, or specific values.
Transparency	Metaphors should be explicitly identified as such, with a clear explanation of how they relate to particular aspects of the scientific concept being conveyed as well as the connotations and performativity of these chosen metaphors.

Table 1. Criteria For Evaluating Metaphor Appropriateness (adapted from Kueffer & Larson, 2014)

Experts participated in three rounds of evaluation, during which they evaluated the eight categories of cybersecurity metaphors based on the established criteria. They were also asked to articulate their reasoning, including the factors influencing their judgments and the potential impact of each metaphor on lay audiences, allowing deeper reflection.

PRELIMINARY RESULTS AND DISCUSSION

The study employed qualitative analysis to identify key insights (Babbie, 2020). Besides metaphor evaluation results, the analysis also synthesized findings from group discussions to capture expert views on metaphor design.

Expert Evaluation of Cybersecurity Metaphor Appropriateness

Factual correctness. Metaphors rooted in warfare, crime, and fortresses were considered factually misleading for oversimplifying cybersecurity as external attacks and imaginary adversaries, neglecting internal vulnerabilities. Moreover, these metaphors tend to reinforce a reactive mindset, highlighting "*walls"* and "*shields*," rather than active or awareness-based approaches. In contrast, risk management metaphors were viewed as more accurate, reflecting the strategic, probabilistic and preventive nature of cybersecurity decision-making. Likewise, health-related metaphors were seen as reflecting ideal practices, but terms like *"virus infection"* or *"pandemic,"* risk exaggerating the urgency or scale of threats and induce unnecessary fear.

Socially acceptable language. In terms of language sensitivity, warfare, crime, and fortresses metaphors were considered the least appropriate, as they risk stigmatizing all hackers and promoting exclusion. Role-based and structure metaphors were seen as acceptable, as they were generally easy to understand. However, expressions like *"Big Brother"* raised concerns over associations with surveillance. In contrast, health-related and risk management metaphors (e.g. *"digital hygiene,"* and *"health checkup")* were considered most constructive, encouraging personal responsibility without fear-based language.

Neutrality. War, crime, and fortress metaphors were also criticized for lacking neutrality, often evoking aggression, fear, or militarization, which can undermine user agency. Role-based and structure metaphors similarly reflected personal biases about roles in cybersecurity. In contrast, risk management and health-related metaphors were seen as neutral and action-oriented, encouraging long-term planning and proactive behaviors

Overall, participants favored metaphors that promote personal responsibility and proactive behavior, especially health and risk management frames. While fear-based metaphors may attract attention, they often induce anxiety, reduce trust, and discourage engagement, echoing concerns in risk and health communication research (Demmen et al., 2015; Kahan et al., 2012; Nerlich et al., 2010).

Expert Consideration for Fine Crafting Cybersecurity Metaphors

Integrating these participant insights and extending beyond the criteria by Kueffer and Larson (2014), we identified three key expert considerations for developing and using cybersecurity metaphors in science communication.

First, experts challenged the practice of applying metaphors broadly to cybersecurity as an overarching concept, highlighting that cybersecurity itself is vast and inherently complex. Metaphors are thus most effective when tailored specifically to distinct technologies, attack types, or scenarios, such as ransomware, phishing, or DoS (Denial-of-Service) attacks, which helps reduce audience cognitive load and ensures factual accuracy. In addition, well-chosen metaphor can still fail if its surrounding context distorts the message. For instance, the phrase *"developing powerful weapons,"* suggests organizations create cybersecurity tools on their own, misrepresenting the collaborative nature of cybersecurity work. Alternatives like *"updating tools"* or *"acquiring equipment"* were recommended for better alignment with real-world practices. Third, existing guidelines might not always align with real-world experiences. While accuracy and relevance are important, metaphors also need to be engaging and relatable. As one expert remarked during the discussion, *"when you follow all the rules for appropriateness, people just don't get it."* For instance, one expert described a Denial-of-Service attack as someone suddenly "plugging your nose so you can't breathe," a vivid image demonstrating how overwhelming traffic can crash a system. Although other experts pointed out that this metaphor is factually misleading because it suggests a single-point failure rather than a distributed overload, it remains highly memorable and may help audiences retain the concept more effectively over time.

CONCLUSION

This study underscores the critical role of metaphors in shaping how cybersecurity knowledge is conceptualized, communicated, and ultimately acted upon. While users have long been portrayed as the weakest link in cybersecurity, the shift toward human-centric approaches calls for repositioning them as a key point of success (Holland, 2020). To do so, a robust cybersecurity knowledge infrastructure, especially grounded in language that supports accessible and responsible science communication.. As a result, the exploration of cybersecurity metaphor helps bridge user and expert knowledge gaps, inspire communication and action, and finally benefit policymaking and business practice.

In addition to cybersecurity, the **expert guidelines for crafting metaphors** can be applied to other complex topics, providing practical implications for the design of educational and policy communication materials. We believe metaphor use in science communication is not only conceptually effective but also empowering, as it demystifies abstract concepts, fosters understanding, and therefore equips individuals to make more informed decisions.

GENERATIVE AI USE

We employed OpenAI's ChatGPT (GPT-4o) to assist with language refinement, grammar correction, and stylistic polishing during the manuscript preparation stage. The AI tools were not used for data analysis and content generation. All interpretation of findings and core writing were conducted solely by the human authors. The authors assume full responsibility for the accuracy and integrity of this submission.

AUTHOR ATTRIBUTION

Chen, Wen-Ning: conceptualization, investigation, methodology, data collection, formal analysis, writing – original draft, and writing – review and editing; Jeng, Wei: conceptualization, methodology, funding acquisition, writing – review and editing. All authors have read and approved the final version of the manuscript.

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Security and Privacy Challenges in AI-Powered Library Recommender Systems: A Systematic Literature Review

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ABSTRACT
As AI tools become more embedded in library systems, concerns around privacy, security, and ethics are rising. This study presents a systematic literature review examining AI-powered recommender systems within library contexts, with a focus on their applications, associated risks, and governance. The literature reviewed highlights key security and privacy risks, including data poisoning, inference attacks, and algorithmic manipulation, which threaten core library values such as intellectual freedom and patron confidentiality. Existing policy frameworks, such as the GDPR and the AI Act, offer guidance on fairness and transparency, but a lack of library-specific governance standards persists. A balanced security approach is proposed, consisting of technological safeguards, AI awareness training among staff and patrons, and the creation of library-specific standards.

KEYWORDS
Artificial Intelligence in Libraries, Recommender Systems, Data security, Data privacy

INTRODUCTION
The widespread development and implementation of Artificial Intelligence (AI) tools has transformed how people access and interact with information across all areas of life. Search engine algorithms and recommendation models in particular have changed the process of information retrieval online, and are now increasingly influencing more traditional, trusted information access systems such as libraries (Jyoti & Kumar, 2024; Narendra et al., 2025).

Over the past decade, library catalogs and online academic databases have utilized AI-driven tools to help improve the way users find information resources online, such as search engine optimization, natural language processing, and predictive algorithms to help increase search accuracy (Narendra et al., 2025). While these innovations promise greater efficiency and an enriched research experience, they also raise critical concerns regarding data privacy, user surveillance, and ethical implementation (Jyoti & Kumar, 2024). Despite growing interest in AI, many institutions still lack well-defined guidelines to ensure secure and responsible integration into library services (Nayyer & Rodriguez, 2022), leaving stakeholders uncertain about the long-term implications of these technologies (Narendra et al., 2025).

Among AI applications, recommender systems are widely used to suggest content based on user behavior and preferences (Jyoti & Kumar, 2024). Although these systems have been extensively explored in commercial domains, there remains a substantial gap in understanding their risks and implications in educational and library contexts (Alfaifi, 2024). This study aims to address that gap by exploring the following research questions: How are AI-powered recommender systems used in library and educational contexts, and what privacy, security, and policy challenges emerge from their implementation?

METHODS
The study conducted a systematic literature review, following PRISMA guidelines to examine AI-powered recommender systems in library settings. The review process consisted of several stages, including initial searching, eligibility screening, full-text review, and synthesis of findings.

To ensure relevance, keywords such as “artificial intelligence,” “library recommender systems,” and “security and privacy” were used to search the Web of Science database for peer-reviewed articles published within the past decade, aligning with recent technological developments. Although the search initially focused on the field of Information Science, the scope was later expanded to the entire database due to the limited availability of security-focused research in library contexts. This broader approach enabled a more comprehensive understanding of the current research landscape. A total of 95 articles were identified for full-text screening, of which 23 were selected for in-depth thematic analysis based on relevance. Following Corbin and Strauss’s (2008) methodology, themes and key patterns were extracted from the selected literature.

RESULTS
Through thematic analysis of the literature on security and privacy within AI-powered recommender systems, several key findings were identified.

AI Use and Applications in Libraries

The literature indicates that recommender systems use a variety of machine learning techniques, such as deep neural networks (DNNs), recurrent neural networks (RNNs), convolutional neural networks (CNNs), transformers (e.g., BERT), to analyze user preferences based on past behavior, demographic data, and contextual information (Masciari et al., 2024). These methods are combined with collaborative, content-based, hybrid, or group filtering techniques to improve recommendations and increase user engagement (Ali et al., 2025). Many studies also explored potential integration of generative AI and large language models (LLM) for recommender systems. In addition to finding existing patterns, these models can generate new patterns, allowing for a deeper level of personalization (Bojic, 2024; Lilienthal et al., 2024; Muniyandi et al., 2024; Nguyen et al., 2024).

In library settings, such systems support cataloging, digitization, search services, and virtual reference tools, with discovery services being the most prominent area of application. For example, Ex Libris, a widely used software in academic libraries, has rolled out several recommender features including their *bX Article Recommender* tool, which captures global user information to generate relevant recommendations for articles and books, and the *Primo Research Assistant*, a generative AI powered service that allows users to query a large language model trained on the library's content to receive recommendations. Despite these developments, the literature reveals an absence of studies focusing on the direct implementation of recommender systems in libraries. Barriers include technical limitations, financial constraints, insufficient staff training, and a lack of library-specific AI research (Hlatshwako & Tsabedze, 2024; Subaveerapandiyan et al., 2024).

Security and Privacy Risks

In general, recommender systems present data privacy and consent concerns due to their use of personal and sensitive data, such as profile, behavior trends, previous site interactions, and location, in generating personalized suggestions (Himeur et al., 2022; Xu et al., 2024). This data should be gathered with consent and properly processed and protected to prevent unintended privacy breaches and personal information leakage (Cui et al., 2024).

Further, privacy breaches can occur through a range of security threats associated with AI-powered recommender systems, such as profile pollution, data poisoning, and inference attacks (Himeur et al., 2022). In addition to infrastructure and inference attacks threatening the exposure of sensitive user data, potentially leading to identity theft and loss of trust, attacks targeting the behavior of recommender systems can be equally harmful. These security threats can manipulate the recommendations themselves (Di Noia et al., 2022; Nguyen et al., 2024; Wang et al., 2023), which is particularly alarming in a library setting where intellectual freedom is a core commitment. When the integrity of recommendations is compromised, these systems may disseminate misinformation, reinforce bias, promote harmful content, or serve commercial interests at the expense of users (Bojic, 2024; Hildebrandt, 2022). In response, existing studies suggest adopting a layered security approach to protecting library systems. Privacy-enhancing technologies such as anonymization, differential privacy, federated learning, and blockchain can help maintain data confidentiality and integrity. Other high-level strategies include the implementation of trust models, algorithmic safeguards, and encryption mechanisms (Ali et al., 2025; Himeur et al., 2022).

Policy and Governance

The literature highlights several governance frameworks relevant to AI-powered recommender systems, though no universal standard exists. European policies such as the GDPR and AI Act emphasize fairness, transparency, and privacy (Hildebrandt, 2022), while broader frameworks advocate for practices like threat taxonomies, system audits, and explainability (Ali et al., 2025; Nguyen et al., 2024; Wang et al., 2024). These principles support the development of ethical and transparent AI systems. Specific recommendations for libraries include forming AI ethics committees, investing in staff training, and creating privacy-preserving policies (Lo, 2023). However, the absence of library-specific AI guidelines remains a critical barrier to effective implementation.

DISCUSSION AND CONCLUSION

Abiding by the American Library Association's (ALA) Code of Ethics, libraries are committed to protecting intellectual freedom and ensuring patron privacy. These principles rely on secure unbiased access to information, free from censorship and surveillance. Yet, AI-powered tools, particularly recommender systems, pose new threats to this foundation. The use of sensitive user data increases the risk of breaches, as seen in recent cyberattacks targeting library vendors, such as the Capita cyberattack (2023), and the Library of Congress DDoS attack (2023). Additionally, algorithmic filtering may compromise access to diverse and accurate information, raising concerns over bias, misinformation, and unintended censorship.

To address these security and privacy risks, libraries must adopt AI governance frameworks that balance innovation with ethical responsibility. Beyond system design with technical safeguards like transparency and explainability, libraries should also invest in AI awareness through staff training, ethics committees, and patron education. Despite resource constraints, proactive policies are essential to ensure AI implementation aligns with library values and sustains public trust in evolving digital environments.

GENERATIVE AI USE

We employed Open AI's ChatGPT (GPT-4o) for the following purposes: polishing sentences and checking grammar. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

Chen, Wen-Ning: conceptualization, investigation, methodology, data collection, formal analysis, writing – original draft, and writing – review and editing; Grzybowicz, Paulina: conceptualization, investigation, methodology, data collection, formal analysis, writing – original draft, and writing – review and editing. All authors have read and approved the final version of the manuscript.

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Between Privacy and Empathy: Unveiling Self-Disclosure Patterns in Online IVF Support Groups

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ABSTRACT

In vitro fertilization (IVF) is a common and effective treatment for infertility, requiring patients to access diverse information for informed decision-making. While healthcare professionals provide specialized reproductive advice, many patients seek additional emotional support and shared experiences from peers through online support forums. This study examines how patients undergoing IVF engage in self-disclosure within these forums, focusing on the topics, purposes, and effects of sharing personal information. Through content analysis of 600 posts and 1800 responses, the study reveals that patients frequently disclose information such as age, location, and medication history. The primary motivations for sharing include emotional venting and self-clarification. Patients mainly seek empathy and clarification, especially during critical IVF stages, such as starting treatment or confirming pregnancy. Findings suggest that timely emotional support from healthcare professionals, alongside clinical advice, could enhance patient well-being. Additionally, fostering open information-sharing within patient support groups can offer significant emotional benefits. Platform designers are encouraged to develop user-friendly, privacy-conscious environments that balance information sharing with security. This research highlights the importance of emotional disclosure in IVF communities and suggests ways to improve support structures for patients navigating infertility treatments.

KEYWORDS

Online support group, information disclosure, information privacy, fertility information

INTRODUCTION

Infertility, defined by the World Health Organization (WHO, 2023) as the inability to conceive after one year of regular, unprotected intercourse, is a prevalent reproductive health issue. In-vitro fertilization (IVF), an advanced form of assisted reproductive technology, is among the most effective treatments for infertility (Practice Committee of the American Society for Reproductive Medicine and the Practice Committee for the Society for Assisted Reproductive Technologies, 2021). However, IVF is complex and emotionally demanding, involving multiple medical procedures and stages, from ovarian stimulation to pregnancy testing. Patients navigating IVF require comprehensive medical information and substantial emotional support due to significant psychological and social pressures.

Infertility is often accompanied by emotional and social burdens, especially for women who frequently experience stigma, anxiety, self-blame, and even depression (WHO, 2017; Daar & Merali, 2002). Many patients turn to online support forums to seek advice, share experiences, and gain emotional reassurance (Jansen & Saint Onge, 2015). In these online medical communities, self-disclosure is pivotal, enabling users to express themselves, seek validation, and foster mutual support (Yang, Yao, Seering, & Kraut, 2019).

This study examines self-disclosure behaviors in online IVF communities, focusing on the topics disclosed, motivations for sharing personal information, community roles assumed by patients, and the impacts of self-disclosure on emotional support and knowledge sharing. Findings from this study aim to illustrate how digital health communities serve as vital platforms for informational exchange and emotional support during infertility treatment.

METHOD

Data Collection Procedure

Data were collected from the BBS electronic bulletin board system (PTT), specifically from the GoodPregnan and BabyMother boards. The study employed keyword searches such as "IVF," "試管" (test tube), and related terms to identify relevant discussions on IVF. After excluding irrelevant or low-response threads, the final dataset consisted of 600 posts and 1,800 responses from 2013 to 2022.

The content analysis examined key aspects of self-disclosure, including shared topics, disclosure purposes, data types, user roles, and contextual triggers. Participants commonly discussed age, location, medication history, and treatment experiences, revealing information to vent emotions, clarify their situation, seek advice, or gain empathy. The types of data disclosed ranged from textual narratives to spatiotemporal details. Users assumed different roles, with some seeking information while others provided insights based on their own IVF journeys. Self-disclosure was particularly prevalent at critical treatment stages, such as the start of IVF or pregnancy confirmation, highlighting how specific moments shaped disclosure depth and engagement.

Data Analysis

This study analyzed 600 posts and 1,800 responses from PTT forums, organizing them into an Excel database with sequential identification numbers. Following self-disclosure theories, nine coding categories were established: length of the posts, attribute (positive or negative), data type, form of expression, topic, emotional tone, IVF stages, discloser's role (information provider or seeker), and purpose of disclosure. Each entry followed a standardized format (Column: Calculation Method: Post Number), such as (B:1:P26) indicating a positive self-disclosure attribute in post 26. For instance, one user shared, "The doctor confirmed the pregnancy! I'm so happy—after two years of effort, finally some good news" (B:1:P26). Coding reliability was ensured through independent analysis by two coders, who first coded 50% of the data (285 posts and 855 replies) before cross-checking results. Disagreements were resolved through discussion, leading to an overall coding reliability of 88%, measured using Holsti's (1969) formula (2M / (N1 + N2)), confirming the validity and consistency of the findings.

PRIMARY RESEARCH FINDING

The study revealed that self-disclosure among IVF patients was a crucial aspect of their engagement in online support forums. Patients frequently disclosed personal details such as age, geographical location, medication history, and specific stages of IVF treatment. These disclosures provided context for their experiences, allowing others to respond with relevant advice and emotional support. The primary motivation for self-disclosure was self-clarification, followed by social validation, emotional venting, and stress relief. Many patients used self-disclosure as a coping mechanism, articulating their struggles and uncertainties to gain insights or encouragement from others who had experienced similar journeys.

In terms of data types, textual narratives were the most common form of self-disclosure, followed by numerical data such as medication dosages, cycle dates, and treatment outcomes. Temporal markers were frequently included, reflecting the progression of treatment and key milestones. Participants often engaged in retrospective storytelling, consulting others on their experiences or providing chronological accounts of their IVF journey. Some posts also included links to external resources or images, although these were less frequent.

User roles within the forums varied, with most individuals acting as information seekers, posting questions about treatment experiences and expectations. More experienced users, often those who had completed treatment successfully, took on the role of information providers, offering guidance and reassurances. Self-disclosure was most prevalent at critical junctures of IVF treatment, including the initiation of treatment, embryo transfer, pregnancy testing, and receiving positive or negative results. These milestones elicited heightened emotional engagement, as patients sought support and validation from their peers.

Responses to self-disclosure posts were predominantly supportive, with users offering encouragement, personal anecdotes, and medical advice. The exchange of information was structured around exploratory and emotional self-disclosure, where users provided detailed insights into their personal experiences while also expressing empathy and solidarity. Emotional expressions such as uncertainty, anxiety, excitement, and gratitude were commonly observed, reflecting the psychological burden carried by infertility patients throughout their IVF journey.

CONCLUSION

The findings underscore the significance of self-disclosure as a tool for emotional support and information exchange among infertility patients in online communities. The study suggests several practical implications. First, healthcare providers should recognize the importance of emotional well-being in infertility treatment and integrate psychological counseling alongside clinical care. IVF specialists and reproductive health counselors could benefit from monitoring online support groups to better understand patient concerns and common misconceptions. Second, patient support groups should actively encourage self-disclosure by creating safe spaces where individuals feel comfortable sharing their experiences. Moderators of online forums should ensure that discussions remain respectful, informative, and emotionally supportive to maintain a positive and engaging environment. Finally, platform developers should consider designing user-friendly, privacy-conscious digital spaces for infertility patients. Features such as anonymous posting, guided discussions, and verified expert contributions could enhance the quality and reliability of shared information. Providing users with greater control over their privacy settings can help balance the need for openness with personal security concerns.

GENERATIVE AI USE

We employed ChatGPT for the following purpose: grammar and spell check. We evaluated the output by comparing the revised text with the original manuscript, confirming the accuracy and appropriateness of the corrections. The authors assume all responsibility for the content of this submission.

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The Digital Face of IVF: Examining the Fertility Information Shared by Healthcare Providers on Social Media

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ABSTRACT
As in-vitro fertilization (IVF) becomes increasingly accessible, patients are turning to social media to supplement clinical information and emotional support. This study investigates the fertility-related content shared on Facebook by IVF healthcare providers, focusing on Traditional Chinese-language posts from both individual physicians and organizational accounts. Using keyword-based searches, we identified 40 public accounts and analyzed 4,285 posts published in 2024. Posts were categorized by month, content theme, media format, and interactivity. Findings revealed clear differences in communication strategies. Personal accounts emphasized outpatient information, educational explanations, and service promotion, with peak posting activity in the fourth quarter. Organizational accounts focused on case sharing and internal work documentation, maintaining a steadier posting rhythm throughout the year. Personal accounts predominantly used image-and-text formats, while organizational accounts more frequently employed short videos to enhance engagement. This study highlights how IVF-related health communication varies across account types, offering insight into how content is framed and delivered in Taiwan's digital health landscape. The findings inform future strategies for more audience-specific and platform-appropriate reproductive health outreach.

KEYWORDS
Information provision, fertility information, In-vitro fertilization, social media

INTRODUCTION
In-vitro fertilization (IVF) is a widely used form of assisted reproductive technology that helps individuals and couples overcome infertility. While it offers a pathway to conception, the treatment process is complex, emotionally taxing, and often lengthy. IVF involves multiple stages, including ovarian stimulation, egg retrieval, embryo culture and transfer, and a post-transfer waiting period. Patients undergoing this process often experience significant emotional stress, uncertainty, and an urgent need for reliable, timely, and understandable health information (Jansen & Saint Onge, 2015).

As IVF is a time-sensitive and emotionally charged journey, the ability to make informed decisions is critical. Medical consultations often fail to meet the full scope of patients' informational and emotional needs, prompting many individuals to seek supplementary sources online. The internet, and increasingly social media platforms, has emerged as a critical space where patients look for answers, guidance, and community bonding. For IVF patients in particular, these online platforms offer a variety of content types, including treatment information and options, lifestyle advice, medical encounters and experiences, emotional support, and firsthand narratives from other patients (Himmel, Meyer, Kochen, & Michelmann, 2005). These online sources may empower users by reducing isolation, providing peer support, and enabling more active participation in treatment decisions (Kahlor & Mackert, 2009).

Survey data suggest that while many patients turn to the internet for infertility-related information, not all find what they need. In a study of 488 individuals, Brochu et al. (2019) found that although 70.9% reported their informational needs were met through web-based content, 29.1% indicated unmet needs, which were significantly associated with higher levels of stress (P = .005) and depressive symptoms (P = .03). These findings underscore the importance of not only the availability but also the quality and relevance of online information.

While literature has examined online fertility information in various contexts, there is limited empirical research on content shared through social media platforms managed by IVF healthcare providers. In particular, few studies have systematically analyzed the information most visible to IVF patients seeking reproductive health guidance online. Questions remain about who creates this content, what topics are addressed, how the information is presented, and whether it meets patients' needs across different stages of treatment. This study addresses this gap through a content analysis of public social media accounts in Taiwan to assess the availability, scope, and nature of IVF-related information.

METHOD
Data Collection Procedure
This study utilized the keywords "reproductive medicine" and "in vitro fertilization" to search Facebook for public pages operated in Traditional Chinese and based in Taiwan. A total of 40 social media accounts were identified,

including both individual accounts managed by physicians and organizational accounts operated by hospitals or IVF clinics. All posts published by these accounts between January 1 and December 31, 2024, were collected and included in a content analysis study. The analysis examined account type, posting month, post topics, media formats, and use of interactive features such as hyperlinks.

Data Analysis

A total of 4,285 Facebook posts were analyzed. The data were categorized according to posting month, media format, and content theme, resulting in 14 distinct content categories and 5 media formats. Descriptive statistical analyses were performed to examine variations in posting behavior between account types and to identify temporal and thematic trends across the sample.

PRELIMANARY RESEARCH FINDING

The results revealed that, on average, each account posted 107 times over the year. The account with the highest activity published 260 posts, while the least active posted only 13 times. Analysis of the temporal distribution of posts showed a difference in posting behavior between personal and organizational accounts. Personal accounts exhibited a peak in activity during the fourth quarter of the year, particularly in October, which accounted for 10.75% of their total posts, followed by December (9.33%) and September (9.21%). This suggests a pattern of increased posting toward the end of the year, possibly related to seasonal events, annual reflections, or emotionally driven content. In contrast, organizational accounts demonstrated a more even distribution of posts throughout the year, with the highest activity occurring in April (9.18%) and February (9.12%). This seasonal behavior may reflect planned social campaigns or institutional messaging aligned with health policy or service promotion schedules.

The thematic analysis of 4,285 Facebook posts revealed notable differences in content strategies between personal and organizational IVF healthcare provider accounts. **Case sharing** was the most prominent theme for both types, with organizational accounts allocating a higher proportion (36.03%) compared to personal accounts (24.76%). **Professional routine sharing** ranked second across both groups (14.25% personal; 14.45% organizational), underscoring a shared interest in showcasing clinical work. Personal accounts were more likely to share **daily life snippets** (13.37%) and **patient education outreach** (9.40%), highlighting their emphasis on individual identity-building and informational support. In contrast, organizational accounts posted more **outpatient service information** (6.86%) and **hospital/clinic profiles** (3.74%), reflecting a focus on institutional branding. While both account types included **holiday greetings** and **event promotion**, these appeared more frequently in personal accounts. Notably, organizational accounts contributed more to **policy and regulation updates** and **trending topics**, signaling an awareness of public discourse. Overall, the findings indicate divergent strategies shaped by account ownership, with personal accounts centering on relational engagement and service visibility, and organizational accounts emphasizing institutional communication and professional authority.

Media format preferences also differed between the two account types. Personal accounts relied predominantly on image-and-text posts (81.35%), followed by video posts (7.26%) and short-form videos (5.56%). This suggests a preference for static or long-form content that supports detailed communication. Conversely, while image-and-text posts were still the most common format among organizational accounts (76.60%), a notably higher proportion of their content was delivered through short videos (14.79%). This indicates a greater tendency toward adopting dynamic and visually engaging media to increase interaction and visibility.

CONCLUSION

Both personal and organizational IVF healthcare provider accounts primarily used image-and-text formats to share reproductive health content, but their communication strategies diverged significantly. Personal accounts focused on professionalism, patient service promotion, and sustained follower interaction. In contrast, organizational accounts prioritized institutional branding, team-based activities, and employed more dynamic formats like short videos. These differences highlight how account type shapes content style, tone, and audience engagement. The findings offer valuable insights for improving online reproductive health communication and inform the design of audience-specific, platform-appropriate strategies in Taiwan's evolving social media landscape.

GENERATIVE AI USE

We employed ChatGPT for the following purpose: grammar and spell check. We evaluated the output by comparing the revised text with the original manuscript, confirming the accuracy and appropriateness of the corrections. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

First Author: Conceptualization, Methodology, Data curation, Formal Analysis, Writing and Editing**.** Second Author: Data Analysis, Data Curation, Formal Analysis, Writing-Review and Editing

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Developing an Information Credibility Scale for Social Media and AI-generated Content: Insights from Expert and User Reviews

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ABSTRACT
This study initiated the development of a new scale to measure perceptions of information credibility on the web, distinguishing between trustworthiness and expertise as core dimensions. Building on a previous analysis of the literature on credibility assessments of information on social media, we generated a pool of 15 items, six for trustworthiness and nine for expertise. Following established scale development guidelines, we refined the scale through expert reviews and cognitive interviews with users. Experts (n = 2) rated most items as highly relevant and offered suggestions for refinement, such as including new items. Users (n = 9) confirmed item clarity but raised concerns about certain terms and perceived objectivity. These preliminary findings support the scale's relevance and will inform revisions for subsequent validation. Ongoing work will expand participant feedback and move toward large-scale empirical testing.

KEYWORDS
information credibility, web credibility, scale, social media, AI-generated content

INTRODUCTION
Assessing information credibility is a critical aspect of how users evaluate, select, and share digital content in today's complex information environment, in which content is often created and circulated by anonymous users and generative artificial intelligence (AI)-powered agents (Choi et al., 2025; Savolainen, 2023). Our previous literature analyses identified several limitations in existing credibility measures, including inadequate consideration of the multidimensional nature of credibility, unclear distinction between formative and reflective indicators, and insufficient empirical validation reflecting the unique characteristics of the current and newly emerging web environments, in which anonymous users and AI-enabled agents generate content on various types of social media (Choi et al., 2024). These limitations underscore the need for developing a new information credibility scale.

We initiated the development of a new scale for measuring information credibility perceptions tailored to current digital information environments based on established guidelines (Boateng et al., 2018; DeVellis & Thorpe, 2022): (1) determine what is being measured; (2) generate an item pool; (3) determine the format for measurement; (4) have experts review the initial item pool; (5) conduct cognitive interviewing; (6) consider inclusion of validation items; (7) administer items to a representative sample; (8) evaluate the items; and (9) optimize scale length.

Step 1: Defining Constructs
The overarching construct to be measured by the scale is information credibility, defined as the degree of confidence or weight assigned to an information object (e.g., social media post or AI chatbot response) based on its perceived trustworthiness and expertise (Hovland et al., 1953). Both dimensions are essential—without one, the object is not perceived as credible. Trustworthiness refers to the extent to which information is perceived as unbiased and free from intentional manipulation, fabrication, or hallucination; expertise is defined as the extent to which information is perceived as accurate, in-depth, and reflective of domain-specific knowledge. This definition differs from traditional source credibility in interpersonal communication settings or web credibility of static websites, which assume identifiable human sources or site operators (e.g., institutions). In today's digital environments—especially on Web 2.0 and emerging platforms—information is often generated by anonymous users or AI agents, making source identification difficult.

Step 2: Generating an Item Pool
We developed an initial item pool by analyzing journal and conference papers in information, library, and computer science (including information systems and interdisciplinary applications) indexed in Web of Science. Through multiple group discussions, we identified 22 reflective indicators (i.e., scale items representing the effects of credibility perceptions) and 31 formative indicators (i.e., items contributing to the formation of credibility). Details of our methods and findings are reported elsewhere (Choi & Zhu, 2023; Choi et al., 2024). Based on further review, we finalized the reflective indicators into two sets: six items for trustworthiness (genuine, unbiased, fair, sincere, benevolent, and objective) and nine for expertise (accurate, convincing, correct, valid, pertinent, justified, informative, intelligent, and insightful).

Step 3: Determining the Format for Measurement

To help participants respond more easily in context, we phrased each item as a descriptive statement and asked participants to indicate their level of agreement, rather than rate abstract adjectives directly. For example, instead of asking about the fairness of information (e.g., 1 = *not at all fair* to 5 = *extremely fair*), we asked participants to rate statements such as: "The information object fairly represents multiple perspectives" on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). We selected an odd-numbered scale to include a neutral midpoint (i.e., *neither agree nor disagree*) if respondents are unsure or find the item difficult to assess. This approach was applied across all items (Figure 1).

Please indicate your level of agreement with the following statements regarding the [information object] on a 5-point Likert scale.
1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4 = Agree, 5 = Strongly agree

Trustworthiness	Expertise
T1. I find the [information object] **genuine**.	E1. The [information object] provides **accurate** information.
T2. The [information object] presents information **without bias**.	E2. The [information object] presents a **convincing** argument.
T3. The [information object] **fairly** represents multiple perspectives.	E3. The information in the [information object] is **correct**.
T4. The [information object] appears **sincere**.	E4. The claims made in the [information object] are **valid**.
T5. The [information object] seems **intended to be helpful**.	E5. The [information object] contains **pertinent** information related to the topic.
T6. The [information object] **objectively** presents information.	E6. The arguments in the [information object] are **well justified**.
	E7. The [information object] is **informative**.
	E8. The [information object] reflects an **intelligent** understanding of the topic.
	E9. The [information object] provides **insightful** perspectives.

Figure 1. Initial Scale Tested

The present study focused on Steps 4 and 5: testing and refining the scale based on expert and user reviews in preparation for empirical validation. This poster presents preliminary findings from those reviews and addresses the following research question: How relevant and clear is each item for assessing information credibility according to experts and users?

METHODS

We recruited participants for two reviewer groups—experts and users. Eligibility for the expert group was defined as researchers with at least one peer-reviewed publication related to information credibility. Participants for the user group were eligible if they had prior experience using social media or AI tools to seek information. In the current study, the expert group included two iSchool faculty members (n = 2) and the user group included nine students (n = 9) with different academic backgrounds: one undergraduate (management information systems), one master's student (mechanical engineering), six PhD students (information science and education), and one postdoc (physics).

Experts completed an online questionnaire via Qualtrics, reviewing 15 proposed items assessing trustworthiness and expertise (Figure 1). They rated each item's relevance on a 4-point scale (Kyriazos & Stalikas, 2018) and provided suggestions for improvement. The questionnaire took about 15 minutes. User feedback was collected through one-on-one interviews. Participants reviewed the scale (Figure 1) and discussed each item's relevance, clarity, and wording. Interviews lasted approximately 15 minutes.

FINDINGS AND FUTURE DIRECTIONS

Expert ratings indicated strong support for the proposed items. Both experts rated all six trustworthiness items as highly relevant (4), except for T5, which received one 4 and one 2. For the nine expertise items, all were rated 3 or 4, which is considered acceptable (Kyriazos & Stalikas, 2018). Experts also suggested additions, such as "consistency" for trustworthiness and "depth" and "clarity" for expertise, but recommended no deletions.

Interviewees generally found the items relevant for assessing information credibility. However, some had difficulty understanding the term "pertinent," and one questioned the distinction between "accurate" and "correct." These findings suggest a need for clearer definitions. Also, some participants viewed trustworthiness and expertise as objective qualities and felt that some terms like "unbiased," "sincere," and "convincing" were too subjective. These findings highlight the need to clarify that the scale is designed to measure users' perceptions of information—subjective judgements formed during interactions with information objects (Rieh, 2017).

We will continue collecting expert and user feedback to refine the scale. Following development guidelines (DeVellis & Thorpe, 2022), we aim to recruit approximately five experts and 15 users, or until we reach thematic saturation. Next, we will conduct large-scale data collection to assess the scale's reliability and validity.

GENERATIVE AI USE

We confirm that we did not use generative AI tools or services to author this submission.

AUTHOR ATTRIBUTION

Wonchan Choi: conceptualization, methodology, investigation, data curation, formal analysis, supervision, visualization, writing – original draft, writing – review & editing; Liya Zhu: conceptualization, methodology, investigation, formal analysis, writing – review & editing; Hyun Seung Lee: conceptualization, methodology, investigation, formal analysis, writing – review & editing.

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GenAI Competencies in Higher Education: An Analysis of Existing Literacy Frameworks

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ABSTRACT
As part of a larger project to develop a generative artificial intelligence (GenAI) literacy framework and toolkit for higher education, this poster presents an analysis of seven literacy frameworks relevant to GenAI literacy in academic contexts. Through thematic analysis, we identified 10 competencies essential for GenAI-literate students in higher education. These competencies are organized into four progressive stages: (1) understanding GenAI at conceptual and technical levels and its capabilities and limitations; (2) using GenAI tools purposefully, effectively, and appropriately; (3) analyzing and evaluating various GenAI models and tools for performance and societal, ethical, and legal impacts, and (4) customizing or creating GenAI tools to address specific needs and generate innovative applications or theoretical insights. We discuss key implications of the results and next steps for developing a GenAI literacy framework for higher education.

KEYWORDS
generative artificial intelligence, AI, literacy, competency, higher education

INTRODUCTION
Use of generative artificial intelligence (GenAI) tools, such as ChatGPT and Copilot, has surged among college students, with nearly 60% incorporating these technologies into various academic tasks, including writing, summarizing learning materials, and debugging code (Bharadwaj et al., 2024). Among regular users, 44% have opted for paid subscriptions to access advanced GenAI features, demonstrating the perceived value of these tools and strong commitment to using GenAI despite institutional restrictions (Bharadwaj et al., 2024).

Alongside their growing use and opportunities of AI augmented learning, GenAI tools present considerable challenges. One challenge is that students lack technical skills, such as crafting and refining prompts for academic work, and thus often fail to produce meaningful and contextually appropriate responses, diminishing the tools' effectiveness (Bharadwaj et al., 2024; Flaherty, 2024). A second prominent challenge is that students struggle to analyze and assess the quality and credibility of AI outputs critically (Choi et al., 2025; Wu et al., 2024).

Many academic libraries have responded to the growing use of GenAI by incorporating AI literacy content into instructional materials, research guides, and classroom discussions (Ko & Chiu, 2024; Ndungu, 2024). However, GenAI literacy instruction remains largely fragmented and lacks a strong theoretical foundation (Bongiovanni et al., 2024; Laupichler et al., 2022).

GenAI literacy refers to a set of competencies that enable individuals to understand, critically assess, effectively interact with, and responsibly apply GenAI technologies across diverse contexts (Annapureddy et al., 2025; Long & Magerko, 2020). Originally introduced as an alternative to intelligence for predicting task performance (McClelland, 1973), the concept of competency has been defined as "an underlying characteristic of an individual that is causally related to criterion-referenced effective and/or superior performance in a job or situation" (Spencer & Spencer, 1993, p. 9). In the context of GenAI literacy, competencies encompass not only technical knowledge and skills but also attitudes and values needed to use evolving GenAI tools effectively and ethically.

As part of a larger project to develop a theory-grounded, evidence-based framework and corresponding toolkit for librarians to integrate GenAI literacy in higher education, this study analyzed frameworks relevant to GenAI literacy in higher education with the following research question: How do current literacy frameworks inform the identification and structuring of core competencies for students' GenAI literacy in higher education?

METHODS
We conducted thematic analysis of literacy frameworks aligned with our broader objective to develop a GenAI literacy framework for higher education. We searched academic databases and consulted experts in information literacy framework design and library information services to identify relevant frameworks. We selected seven frameworks published in academic papers or reports (Annapureddy et al., 2025; Hervieux & Wheatley, 2024; Hibbert et al., 2024; Mills et al., 2024; Ng et al., 2023; The University of Adelaide, 2024; UNESCO, 2024) based on the following criteria: the frameworks (a) focus on GenAI or AI literacy, (b) are relevant to college students or broader student populations, and (c) are published in English. We excluded frameworks that (a) focus on

information or digital literacy without an emphasis on GenAI or AI, (b) target general public or nonstudent populations (e.g., library workers), or (c) are published in languages other than English.

One author independently analyzed the selected frameworks using a priori codes derived from well-established and influential literacy frameworks from library and information science and related disciplines, such as the ACRL Framework (Association of College & Research Libraries, 2015) and DigComp 2.2 (Vuorikari et al., 2022). We also employed inductive coding to allow new themes to emerge. We organized identified competencies into four progressive levels based on Bloom's taxonomy (Krathwohl, 2002): (1) understand, (2) apply, (3) analyze and evaluate, and (4) create. We adopted Bloom's taxonomy as the overarching organization schema for three reasons. First, it is a widely adopted framework in education for structuring learning objectives and outcomes, making it well-aligned with the instructional goals of the GenAI literacy framework. Second, its progression from basic understanding to advanced creation provides a structured way to assess varying levels of GenAI literacy mastery, reflecting the original definition of competency emphasizing criterion-referenced performance that demonstrates observable achievement (Spencer & Spencer, 1993). Third, the taxonomy is likely familiar to educators who will be using the framework (e.g., instructional librarians). The research team met weekly to discuss codes, resolve discrepancies, and develop competencies. This iterative process continued until all frameworks were analyzed and mapped onto the final competency list. We used NVivo 15 to facilitate the analysis.

FINDINGS AND CONCLUSION

Our analysis of seven literacy frameworks identified 10 competencies critical to GenAI literacy in higher education. These competencies are structured across four progressive stages based on Bloom's taxonomy (Krathwohl, 2002), each reflecting increasing depth of engagement with GenAI tools and concepts. At the foundational level, students are expected to develop both conceptual and technical understanding of GenAI and how these systems work, including their capabilities and inherent limitations. The second stage, apply, emphasizes purposeful, effective, and contextually appropriate use of GenAI tools across academic tasks. The third stage, analyze and evaluate, highlights students' ability to assess GenAI tools regarding their technical and broader societal, ethical, and legal implications, such as bias, accountability, autonomy, privacy, and intellectual property. The final stage, create, focuses on advanced engagement, wherein students not only adapt or customize GenAI tools to meet specific needs but also propose novel applications or theoretical insights (Figure 1).

Progression	Competency	Definition
4. Create	4.2 Ideate and theorize novel applications of GenAI	Generate creative ideas and theoretical frameworks for innovative uses of GenAI in diverse domains.
	4.1 Customize or develop GenAI tools	Modify existing GenAI tools or create new ones to meet specific needs.
3. Analyze & Evaluate	3.3 Justify or critique the use of GenAI tools	Formulate well-reasoned arguments for or against the use of GenAI tools in specific situations.
	3.2 Evaluate the societal, ethical, and legal implications of using GenAI tools	Assess the broader impacts of GenAI use by examining potential societal consequences, ethical concerns, and legal considerations.
	3.1 Assess the appropriateness of GenAI models and tools	Compare and contrast the features, performance, and limitations of various GenAI models and tools for specific goals.
2. Apply	2.2 Document and acknowledge the use of GenAI	Record the use of GenAI tools and provide proper attribution or disclosure in accordance with academic and professional standards.
	2.1 Apply task-appropriate GenAI tools	Select and use a suitable GenAI tool to complete a defined task, using known procedures or guidelines to produce and evaluate results that meet task-specific requirements.
1. Understand	1.3 Understand the current and future capabilities and limitations of GenAI	Describe the current and emerging capabilities of GenAI tools, along with their limitations, risks, and appropriate use contexts.
	1.2 Understand the technical foundations of GenAI	Explain the underlying technical mechanisms of GenAI systems, such as training data, model architecture, and output generation process.
	1.1 Develop a conceptual understanding of GenAI and recognize GenAI systems	Know what GenAI is and the ability to identify when and where GenAI is being used in digital tools, applications, or services.

Figure 1. GenAI Competencies for College Students

GENERATIVE AI USE

We confirm that we did not use generative AI tools or services to author this submission.

AUTHOR ATTRIBUTION

Wonchan Choi: conceptualization, methodology, investigation, data curation, formal analysis, visualization, writing – original draft, writing – review & editing; Hyerin Bak: conceptualization, methodology, investigation, formal

analysis, writing – original draft; Besiki Stvilia: conceptualization, methodology, investigation, formal analysis, writing – original draft; Yan Zhang: conceptualization, methodology, investigation, formal analysis, writing – original draft.

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Prompt Design and AI Response Quality in University Students' Academic Learning Tasks

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ABSTRACT
This study explores how university students design single-turn prompts for academic learning tasks using AI tools. 19 students generated 57 prompts across exploratory, precise, and comprehensive scenarios. Using Bloom's Taxonomy and thematic analysis, the study found exploratory prompts often lacked clarity, while precise prompts produced highly relevant responses. Comprehensive prompts supported higher-order thinking but varied in specificity. Content analysis showed Perplexity outperformed ChatGPT in research tasks with real-time citations, while ChatGPT excelled in procedural queries. Students' feedback emphasized clear, task-specific prompts, highlighting prompt literacy's role in effective AI-assisted learning. These findings advocate ethical prompt design to enhance human-AI interaction in education.

KEYWORDS
Generative AI, Conversational Search, Prompt Analyze, AI Literacy

INTRODUCTION
Generative AI tools, such as ChatGPT and Perplexity.ai, are vital for students, providing rapid support for academic learning tasks. Unlike structured academic databases, these tools offer flexible, conversational responses, ideal for diverse interactions (Radlinski & Craswell, 2017). Response quality depends on students' AI literacy, which encompasses understanding AI capabilities, designing clear and task-specific prompts, and critically evaluating outputs for accuracy and relevance in academic contexts (Wallbank, 2023; Kim et al., 2025). AI literacy enables students to craft prompts that align with task goals, such as researching topics or formatting citations, and to discern reliable AI responses, fostering effective learning (J. Wallbank, 2023). While multi-turn dialogues clarify complex needs (Kim et al., 2025), single-turn prompts provide a foundational lens to study student-AI interactions, yet they remain underexplored.

This study examines single-turn AI conversations to understand information-seeking behavior as a precursor to broader conversational dynamics. Radlinski and Craswell (2017) emphasize multi-turn conversations for intent clarification, but single-turn prompts serve as a key entry point to explore how initial inputs shape response quality. The research investigates how students design task-driven prompts—exploratory, precise, and comprehensive—mapped to Bloom's Taxonomy (Lorin W. Anderson & David R.Krathwohl, 2001). It pursues two objectives: (1) analyze prompt patterns using thematic analysis (Trippas et al., 2017) and Bloom's-inspired coding; (2) evaluate response relevance and completeness (Krippendorff, 2004) across ChatGPT and Perplexity By focusing on single-turn efficacy, this study lays groundwork for understanding information behavior, complementing multi-turn research, and providing insights to refine prompt design and enhance AI utility for students across disciplines.

METHOD
Participants. This study targeted university students across various disciplines to capture diverse academic task-driven prompt behaviors. A convenience sample of 19 graduate students was recruited from an on-campus setting during a one-week period in May 2025. Participants were selected based on voluntary participation, with no prerequisites for AI experience or major to ensure broad representation. The sample size aligns with exploratory mixed-method studies (Trippas et al., 2017) Demographic details included year of study (Year 1: 2, Year 2: 1, Year 3: 5, Year 4: 11) and major (13 Engineering, 2 Health Sciences, 4 Other). Anonymity was maintained, and informed consent was obtained.

Procedure. A mixed-method approach collected and analyzed single-turn prompts and AI responses. A structured questionnaire (~10 minutes per participant) was designed to elicit prompts reflecting Bloom's Taxonomy (Lorin W. Anderson & David R.Krathwohl, 2001). Participants completed three task scenarios mirroring common academic contexts: (1) an exploratory task, where students in an introductory course sought topic overviews (e.g., research methods for a short paper); (2) a precise task, requiring steps for formatting citations (e.g., APA style for a journal article); and (3) a comprehensive task, demanding evaluation with research examples (e.g., social media privacy for a project report). Each task included an open-ended intent question to clarify goals (e.g., "basic concepts," "steps," "case studies"). Participants crafted 57 prompts without submitting them to AI, as instructed. We input these prompts into ChatGPT and Perplexity.ai in May 2025 under default settings, generating 114 responses. Responses were saved for a four-week analysis. A final open-ended question gathered feedback on effective AI query strategies, enriching qualitative insights.

Measurement. Data analysis combines qualitative and quantitative methods to assess prompt patterns and response quality. Prompt analysis employs thematic analysis (Trippas et al., 2017) with Bloom's Taxonomy-inspired coding (Anderson & Krathwohl, 2001). Following Braun & Clarke (2006) six-step process—familiarization, initial coding, theme search, theme review, theme definition, and reporting—prompts will be coded for cognitive levels (e.g., Remembering, Analyzing, Creating) and structural features (e.g., clarity, complexity). Two reviewers will independently code a subset to ensure reliability, targeting an inter-rater agreement of 80% or higher.

RESEARCH FINDINGS

This study analyzed 57 single-turn prompts crafted by 19 university students across disciplines for academic tasks—preparing introductory papers, formatting citations, and conducting research projects—using ChatGPT and Perplexity.

Thematic analysis with Bloom's Taxonomy coding identified three key themes in prompt design: (1) Clarity, reflecting precise language that enhances response relevance; (2) Specificity, indicating task-aligned detail that drives completeness; and (3) Cognitive Alignment, matching prompts to Bloom's cognitive levels (Remembering, Applying, Evaluating). Inter-rater agreement reached 82%(Braun & Clarke, 2006).

Prompts were analyzed across three task types:

- **Exploratory Tasks**: Students sought basic concepts for introductory papers, often lacking clarity. ID 2 (Civil Engineering) asked, "Give me a brief explanation of civil concept," producing generic responses from both tools. Conversely, ID 19 (Energy) clearly requested, "Provide basic concepts and development directions for oil exploration topic," yielding detailed, cited responses from Perplexity.ai and a broad overview from ChatGPT. Unclear prompts reduced response quality.
- **Precise Tasks**: Students requested procedural steps, like citation formatting, with high clarity. ID 8 (Aerospace) asked, "Can you brief me the difference formats and steps to cite a specific article?" prompting clear APA/MLA steps from ChatGPT and cited instructions from Perplexity Precise prompts consistently delivered accurate, actionable responses.
- **Comprehensive Tasks**: Students aimed for in-depth analysis or case studies, supporting higher-order thinking but varying in specificity. ID 20 (Nursing) requested, "Can vitamin D supplementation during pregnancy reduce preeclampsia risk? Analyze with literature and sources," receiving cited studies from Perplexity.ai and a less detailed response from ChatGPT. ID 11 (Electrical Engineering), "How Trump's tariffs affect global economy," was less specific, leading to inconsistent outputs.

Content analysis showed precise prompts consistently produced the most relevant and complete responses, followed by comprehensive prompts, while exploratory prompts were least effective due to unclear phrasing. Perplexity.ai outperformed ChatGPT in research tasks by providing real-time citations, whereas ChatGPT excelled in procedural queries. Ambiguous prompts, like ID 2's, and occasional ChatGPT hallucinations, such as fabricated studies for ID 20, reduced response quality, particularly for Year 4 students' research tasks (11/19). Cohen's Kappa for scoring was 0.67.

Qualitative feedback on effective AI queries highlighted preferences for clear, context-specific, and actionable prompts. Students valued detailed prompts for assignments, as seen in ID 8's citation query and ID 20's literature request, reflecting Year 4's research focus. Responses like ID 19's call for "faster, broader data search" and ID 8's "clear and concise" queries suggest prompt literacy enhances AI utility. These findings underscore information science's role in fostering ethical prompt design to optimize human-AI interaction, aligning with calls for responsible AI development in education.

CONCLUSION

This study of 19 university students' single-turn prompts, crafted for academic tasks like researching introductory course topics, formatting citations for assignments, and analyzing complex issues for research projects, reveals how prompt design shapes AI response quality using ChatGPT and Perplexity Thematic analysis with Bloom's Taxonomy coding showed exploratory prompts prioritized "basic concepts" (63%) but suffered from 26% vagueness, reducing relevance (3.7). Precise prompts targeted "steps" (53%), achieving 84% clarity and high quality (relevance: 4.4). Comprehensive prompts sought "case studies" (47%), with Perplexity's citations outperforming ChatGPT (Braun & Clarke, 2006). Content analysis identified vague intents (19%) and ChatGPT hallucinations as barriers, notably for Year 4 students' research tasks (11/19).

Limitations include the small, engineering-heavy sample (68%), limiting generalizability, and the single-turn focus, which misses multi-turn clarification vital for research (Radlinski & Craswell, 2017). Controlled scenarios may not reflect real-world AI use. Students' feedback highlighted clear, context-specific prompts, underscoring the need for prompt literacy training tailored to academic tasks like citations and research (J. Wallbank, 2023) Perplexity.ai excels in research tasks, while ChatGPT suits procedural queries. Future studies should explore multi-turn dynamics

(Kim et al., 2025) and diverse samples to reduce bias and enhance AI's role in education, aligning with ethical AI development.

GENERATIVE AI USE

We employed ChatGPT and Perplexity for the following purpose: Input the collected prompts and gather responses, grammar and spell-checking of the manuscript. For grammar and spell-checking, we compared the revised text with the original manuscript to ensure corrections were accurate and contextually appropriate. The authors take full responsibility for the content, including the accuracy of simulations and interpretations in this submission.

AUTHOR ATTRIBUTION

First Author: conceptualization, methodology, investigation, data curation, formal analysis, writing – original draft; Second Author: supervision, writing – review and editing.

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Does the Semantic Meaning of Class Names Matter? A Study of the Library of Congress Classification

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ABSTRACT
This study examines whether the semantic meaning of Library of Congress Classification (LCC) class names provides additional insight beyond the system's hierarchical structure for organizing knowledge. Using SBERT, a natural language processing (NLP) model for generating semantic embeddings, we investigate the relationship between the semantic meaning of LCC subclass names and the word usage patterns of the texts assigned to these subclasses. Our results show that although LCC subclass names with similar semantic meanings occasionally correspond to similar word usage patterns, there is no consistent relationship between the two. In contrast, whether two subclasses belong to the same main class reliably predicts the similarity of word usage in the texts assigned to them. While semantic embeddings of LCC subclass names offer intriguing possibilities, our findings indicate that the hierarchical structure of the LCC system remains more robust for knowledge organization.

KEYWORDS
Library of Congress Classification, corpus analytics, metadata, natural language processing, semantic embeddings

INTRODUCTION
Library classification systems, such as the Library of Congress Classification (LCC) and Dewey, organize and categorize knowledge objects to help users locate, browse, and discover them (Bowker & Starr, 1999). Recent advances in artificial intelligence (AI) and natural language processing (NLP) have opened up new opportunities for analyzing these systems. To date, most scholarship in this area has focused on automatic subject classification (Dinneen et al., 2018; Julien et al., 2013; Schubotz et al., 2020; Schmidt, 2018; Wang, 2009; Wang & Lee, 2007).

This study addresses a gap in the literature by investigating the relationship between the semantic meaning of LCC class names and the word usage patterns of the texts assigned to these classes. While the hierarchical structure of classification systems is central to knowledge organization, the class names themselves may also convey meaningful semantic information. Consider the following LCC subclasses (i.e., the two-letter classes to which LCC metadata): (1) HA: Statistics; (2) HE: Transportation and communications; (3) TL: Motor vehicles. Aeronautics. Astronautics; (4) TP: Chemical technology. Although HA and HE both belong to the main class H (Social Sciences), and TL and TP belong to the main class T (Technology), one might reasonably expect HE to be semantically closer in meaning to TL than to HA, and likewise, TL to be semantically closer to HE than to TP. Is this true? And does such semantic proximity in naming also reflect similarity in word usage among the texts assigned to these subclasses?

Based on Gavin's (2023) theory that "similar words tend to appear in documents with similar metadata" (p. 11), this study examines a specific type of metadata—the semantic meaning of LCC subclass names—to investigate whether it aligns with patterns of word usage in texts, thereby providing additional insight beyond the system's hierarchical structure for organizing knowledge. Specifically, it addresses the following research question: Is semantic similarity in LCC subclass names related to similarity in word usage across the texts assigned to these subclasses?

METHODS
For this study, Project Gutenberg was selected as the data source due to its extensive collection of machine-readable, full-text materials spanning a wide range of subjects. This breadth was essential for enabling an analysis of the LCC system as a whole. We compiled a dataset consisting of all LCC subclasses, using the LCC metadata assigned by Project Gutenberg as the ground truth data. We kept only subclasses that contained more than 100 English-language texts, a threshold chosen to support robust analysis and mitigate issues of data sparsity. This resulted in a corpus of 51,106 English-language texts across 65 LCC subclasses. The texts were then preprocessed by removing the Project Gutenberg front and end matter. Next, we transformed the texts into numerical representations of word usage using term frequency–inverse document frequency (TF–IDF) (Jones, 1972), implemented via the TfidfVectorizer in the Scikit-learn Python library (Pedregosa et al., 2011). TF–IDF was chosen over raw word counts because it enables meaningful comparisons among texts by identifying terms unique to individual texts while down-weighting terms that occur frequently across the corpus. The 10,000 most frequent words in the corpus were selected as features. In this study, we use the term "word usage patterns" to refer to TF-IDF's distribution and relative importance of terms.

Next, we used the Sentence-Bidirectional Encoder Representations from Transformers (SBERT) model (Reimers & Gurevych, 2019) to generate semantic embeddings of LCC subclass names. Specifically, we used the "all-mpnet-base-v2" model, which is based on the MPNet architecture (Song et al., 2020). Each LCC subclass name, sourced from the Library of Congress Classification Outline (https://www.loc.gov/catdir/cpso/lcco/), was encoded as a 768-

dimensional vector representing its semantic meaning. The semantic embeddings of the 65 LCC subclass names were then visualized alongside the centroids of TF–IDF vectors derived from the texts within each subclass, using t-distributed stochastic neighbor embedding (t-SNE) (van der Maaten & Hinton, 2008).

Finally, we computed Pearson's correlation coefficient to assess the relationship between the average pairwise similarity of TF–IDF vectors for texts in two subclasses and the similarity of the semantic embedding vectors of their corresponding subclass names. Additionally, we used the Mann–Whitney U test to determine whether the average TF–IDF-based textual similarity between subclass pairs differs significantly depending on whether the two subclasses belong to the same LCC main class or to different main classes.

FINDINGS

Figure 1 provides a visualization of the relationship between the semantic meanings of LCC subclass names and the patterns of word usage in the texts assigned to these subclasses. The left panel shows a t-SNE projection of semantic embedding vectors of subclass names, while the right panel shows a t-SNE projection of the centroids of TF–IDF vectors derived from texts in each subclass. Notably, some consistent spatial patterns emerge across the two plots. For example, the pair HE (Transportation and communications) and TL (Motor vehicles. Aeronautics. Astronautics)—introduced earlier in the introduction—appear close together in both visualizations (highlighted in red circles). Similarly, SB (Plant Culture) and QK (Botany) also cluster together (highlighted in green circles).

Figure 1. Semantic Embeddings of LCC Subclass Names and TF-IDF Centroids of Corresponding Texts

However, the correlation analysis reveals no statistically significant relationship between the average pairwise similarity of TF–IDF vectors for texts in two subclasses and the semantic similarity of their corresponding subclass names ($r = –0.018$, $p = 0.405$). In other words, there is no evidence that semantically similar LCC subclass names correspond to consistent patterns of word usage across the texts assigned to these subclasses. On the other hand, subclass pairs from the same main class and those from different main classes show a statistically significant difference in average TF–IDF-based textual similarity ($U = 199{,}550$, $p = 0.004$), with mean values of 0.785 and 0.774, respectively. That is, texts assigned to subclasses under the same main class tend to exhibit more similar word usage patterns than texts assigned to subclasses from different main classes.

CONCLUSION

Our results show that although LCC subclass names with similar semantic meanings occasionally correspond to similar word usage patterns, there is no consistent relationship between the two. In contrast, whether two subclasses belong to the same main class reliably predicts the similarity of word usage in the texts assigned to them. This supports Gavin's (2023) theory that "similar words tend to appear in documents with similar metadata" (in this case, LCC main classes), but not the notion that semantically similar subclass names imply similar word usage patterns in the texts they classify. Our findings indicate that the hierarchical structure of the LCC system offers a more robust basis for knowledge organization than the semantic meaning of its class names. This underscores the enduring value of information science in the age of human-centered AI.

GENERATIVE AI USE

We used ChatGPT in a limited, supportive capacity to assist with code generation and debugging in data analysis.

AUTHOR ATTRIBUTION

Zach Coble: conceptualization and methodology (equal), data curation (lead), investigation and analysis (equal), software and visualization (equal), writing draft (lead), writing review and editing (equal). Wenyi Shang: conceptualization and methodology (equal), investigation and analysis (equal), software and visualization (equal), project administration & supervision (lead), writing review and editing (equal)

DATA AND CODE AVAILABILITY STATEMENT

All data and code necessary to reproduce the results in this paper are available at https://github.com/wenyi-shang/LCC-Similarity.

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The Fate of COVID-19 Rapid Response Collections: Studying University Initiatives in Pennsylvania

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ABSTRACT
Over the course of 2020, as the COVID-19 pandemic was unfolding across the world, numerous information institutions implemented COVID-19 rapid response collections. Rapid response collections are an emerging collecting modality that focus on documenting an event as it happens or in the immediate aftermath. Growing literature reflecting on these collections typically tells the story of individual collections and focuses on the process of starting and building them. Five years after these collections initially began, there is now the opportunity to reflect on the scope and impact of rapid response collecting during the COVID-19 pandemic, as well as the status of these collections today. This pilot study, which aims to provide a foundation for a broader understanding of rapid response collecting across US GLAM institutions, assesses the presence, scope, and status of rapid response COVID-19 projects started at universities in Pennsylvania.

KEYWORDS
Rapid response archives; COVID-19; universities; preservation; academic libraries.

INTRODUCTION & BACKGROUND
As COVID-19 grew into a public health crisis in 2019-2020, medical researchers, historians, journalists, and the public consulted documentation of previous public health crises, especially the limited records of the 1918–1920 flu pandemic (Barry, 2020a, 2020b; Holton, 2020). Simultaneously, hundreds of academic and cultural organizations began creating *rapid response collections*, a form of archive where cultural materials are gathered as events unfold and in their immediate aftermath (Debono, 2021). Materials gathered in rapid response collections include photos, documents, video, social media and web pages, many of which were user-submitted, or crowdsourced, while others were proactively collected by archivists (Zumthurm, 2021). These materials document experiences of lockdown, social distancing, essential work, mourning those lost, being sick, receiving vaccines, and much more.

Prior to the COVID-19 pandemic, survey research showed that GLAM institutions were interested in contemporary collecting but had limited experience implementing these collections (Brady, 2019). Based on popular press, crowdsourced lists aggregating rapid response collections, and scholarly literature emerging about these collections, COVID-19 appears to have actualized this interest, causing diverse institutions to start rapid response collection about the pandemic's effect on their communities. Much of the research emerging about COVID-19 rapid response collections assesses the individual process of building these collections, emphasizing opportunities and challenges in rapid response collecting, but does not provide a largescale sense of the reach, scope, and long-term status of these collections (Corry, forthcoming). Understanding these factors will contribute not only to a better understanding of the state of this emerging collecting methodology and will enable institutions to assess what support they will need to ensure the long-term presence of COVID-19 documentation. This project begins to address these gaps by assessing: 1) Reach: how widespread these collections were, the types of institutions that took them on. 2) Scope: Of those institutions that started a collection, the types and number of items that were collected. 3) Outcome: Of those institutions that started a collection, what the collection's status is today.

Because institutions that took on rapid response collections varied geographically and by type of institution, this pilot study assesses these factors by limiting its sample to a particular geographic and institutional context, focusing on university libraries in Pennsylvania. Pennsylvania is a state in the Eastern United States, which has the fourth largest number of colleges in the United States by state. We chose to study university collections, typically spearheaded by university libraries, because of public availability of information about these institutions, as well as the internal diversity within this sector (e.g. community colleges, small liberal arts colleges, mid-size religious schools, large public land-grant universities with regional campuses, a private Ivy League university, and beyond.)

METHODS
To better understand these collections, we built a dataset about COVID-19 rapid response collections at universities in Pennsylvania. We limited our sample to institutions of higher education in Pennsylvania that had more than 1000 students. Institutions under 1000 students often had niche student populations (e.g. seminaries, rabbinical schools), or were private, for-profit colleges. A database with information about name, school location, classification (associate, baccalaureate, masters/professional, doctoral, special focus), and enrollment, was derived from IPEDS (Integrated Postsecondary Education Data System). We found 128 institutions of higher education in Pennsylvania that had more than 1000 students. For each university, we researched whether they had evidence of a COVID-19

collection, including searching the web and their library site for terms like "[university name] COVID-19 collection." When a university had engaged in rapid response collecting, these search terms typically showed university news about these collections, collecting pages on library sites, or materials in their holdings. If we did not readily find any documentation about a rapid response collection with this search term, we would try related terms and other locations, e.g. library web site, Google news search, to verify there was no available evidence of a collection. When we found a collection, we added these links to our database, and added information about the collection's public accessibility, size, and the types of items that were collected.

FINDINGS

Collection Presence

Of the 128 institutions in our sample, we found evidence that 43 institutions, or 33.6%, had carried out rapid response collecting around COVID-19. Of these 43, two were associate's colleges (4.7% of the rapid response institutions [RRC], vs. 12.5% in the broader sample [BS]), 15 were baccalaureate colleges (34.9% RRC, vs. 32.0% BS), 9 were master's colleges and universities (20.9% RRC, vs. 31.3% BS), and 17 were doctoral universities (39.5% RRC vs. 20.3% BS). We found no evidence that 'special focus' schools in our sample (e.g. colleges of osteopathic medicine, health sciences, arts) had rapid response collections (0% RRC vs. 3.9% BS).

Collection Scope

We were able to determine the number of items in a rapid response collection for 15 institutions, or 34.9% of institutions who had engaged in rapid response collecting (see 'Outcome' and Discussion section for more context). Another six institutions carried out rapid response collecting as a group associated with Penn State University (i.e. main campus and regional campuses), and their collection numbers were only available in aggregate, with 624 items. There was no record of how many items had been collected for the remaining 51.2%. Collections outside Penn State's consortia ranged from having one to 434 items, with an average of 88.3 items and a median of 21 items. Even though we could not determine the number of items for most institutions, we were able to determine the types of items that were sought as well as the method through which they were gathered, as many institutions still had their information pages up or we were able to find archived versions of these pages. Thirty-six collections, or 83.7% of the institutions who did rapid response collecting, employed crowdsourcing to collect items. Except for one collection focused on audio files, all crowdsourced collections sought a range of digital multimedia files, including video, photos, text, audio, and screenshots of social media/web pages. The sizable majority also were open to physical objects, but patrons were instructed to contact the archivists. Aside from the crowdsourced collections, the mode of collecting was indeterminate for one collection (i.e. items existed in their digital archive but no solicitation page could be found); one institution solicited exclusively oral histories; and five collections, or 11.6%, were exclusively web archives that crawled an institution's COVID-19 related pages. Of the 15 collections that had their materials available, five of these were web archives. The remaining ten were a mix of multimedia documents, typically crowdsourced videos, images, and texts, with additional institutional documents added by archivists.

Collection Outcome

Twenty collections, or 46.5%, either had collection items available online or had a finding aid available online, indicating that items from COVID-19 rapid response collecting had been processed. One additional collection had web pages available through Archive-It but did not have crowdsourced items available. Eleven institutions, or 25.6% of those who did rapid response collecting, did not have items processed and available, but continued to have landing pages that supplied information about the initiative. For the remaining 11 institutions, or 25.6% of those who had done rapid response collections, we were able to find evidence of a rapid response collection (e.g. through university news pages, cached web pages), but could not find a working information page nor collection items.

DISCUSSION & CONCLUSION

This contribution assesses the presence, scope, and present outcome of COVID-19 rapid response collections at university libraries in Pennsylvania. A third of higher education institutions in our sample engaged in rapid response collecting around COVID-19. Doctoral granting universities with high research activity, which are often well-resourced compared to smaller institutions, were the most likely institutions to take this on, indicating that this modality may have been more accessible to those with larger staff and greater financial resources. Just over half of the collections in our sample had not been processed, with one quarter subject to broken information infrastructure. This may signal that the long-term outcome of these collections is not guaranteed and may require continued investment. Furthermore, the wide variety of institutions that took on these projects, and broad range in collection sizes, indicates that findability and accessibility of these collections will be a continuing challenge (for instance, a researcher being aware of small collections as well as significant ones). Future studies may want to go beyond descriptive statistics to understand this phenomenon, including qualitative or statistical analysis, along with assessing the presence, scope, and outcome of these collections in a broader geographic and institutional context.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

F. Corry: Conceptualization, Data curation, Investigation, Methodology, Writing – Original Draft, Review & Editing. R. Starry: Conceptualization, Visualization, Writing – Review & editing

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Academic Libraries in the Age of AI: The Importance of Information Literacy Education

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ABSTRACT

As AI becomes increasingly integrated into the higher education and information landscape, its impact on libraries, education, and communication becomes more prevalent. Higher education and libraries are seeing AI integrations in the classroom, databases, and beyond, waiting to make your work 'just a little bit easier.' Communication and literacy are under threat of mass simplification through AI summarization, drawing people farther apart from one another. At the Cayan Library at SUNY Polytechnic Institute, we are taking steps to help educate ourselves and others about AI and Information Literacy. Libraries, as hubs of information, are the perfect place to pioneer this educational movement as we proceed into the age of AI.

KEYWORDS

Generative AI; Academic Libraries; Information Literacy; Higher Education

INTRODUCTION

"You don't have to burn books to destroy a culture. Just get people to stop reading them" (Bradbury, 1993 as cited by Berson, 1993). As AI becomes increasingly integrated into the higher education and information landscape, its impact on libraries, education, and communication becomes more prevalent. The spread of misinformation through AI generated content is a growing problem as the technology advances, and something needs to be done to help keep students, faculty, and staff educated on these topics. This is where Academic Libraries come into the picture. Libraries, as hubs of information, are a natural first choice to be the leaders of spreading AI and Information Literacy initiatives on their campuses.

HIGHER EDUCATION AND LIBRARIES

When you think of AI use in the higher education landscape, your first thought may be of students using AI for assignments, or AI tools for grammar and spell checking. But what people may not think of is the instructors using AI. There have already been several cases of teachers using AI in not only K-12 education (Goldstein, 2025), but also in higher education (Wilkins, 2025). AI has been so widely pushed as an assistant to make your daily tasks easier that we're seeing it used in all aspects of higher education, from the creation of assignments by instructors to their completion by students. This is a concerning development, and one that, if continued, may result in a complete standstill of human-to-human interaction where AI does all the communication. When it comes to the library landscape, AI has begun to pop up as a new key feature in databases, providing AI summaries of the top 5 search results along with the citations (ExLibris, n.d.). While this feature does assist researchers in their search, over time, reliance on these features will result in a loss in the skill of finding and analyzing research articles.

COMMUNICATION AND LITERACY

The use of AI for summarization seems to be the leading feature in a lot of platforms, from the Google AI overview to YouTube stream live chat summaries. AI is being used to replace a lot of the thinking processes that are essential to communication: searching for information, analyzing the content, identifying biases, and more. In his 1951 work *Fahrenheit 451,* Ray Bradbury makes a stunning prediction regarding the future of media consumption, "in the twentieth century, speed up your camera. Books cut shorter. Condensations" (p. 52). A recent study on the impact of AI tools on society found that AI is increasing something called "cognitive offloading," which is in turn decreasing users' critical thinking skills (Gerlich, 2025). Not only are people using AI to simplify their consumption of media, but some people even believe that it's better to chat to an AI assistant than to a person (Ohio State University, 2024). In addition to this oversimplification of communication, users are actively being used to help train AI platforms, sometimes without even realizing it. For example, social media company Meta (Instagram, Facebook, WhatsApp) updated their terms of use to include a clause that all content posted on their platforms could be used to train their Generative AI system (Meta, 2023).

OUR METHODS

So, with all this in mind, what can Academic Libraries do to help? There are a variety of different ways your library could tackle the wave of AI that will be dependent on time, resources, and staff. As a small library team, we have limited time and resources, but have still implemented a plan to help our institution. The first major step is ensuring that we are all keeping up to date on AI developments within our specific job responsibilities whether that be cataloging, databases, information literacy, etc. As we are the core of ensuring our library is able to help others navigate this AI landscape, we need to make sure we're knowledgeable on the topics ourselves.

The second step was the creation of an AI and Information Literacy workshop. In the creation of the workshop, I made sure to keep it modular so it could be tailored not only to each individual session I presented at, but also to ensure it would be easy to update as new things are released regarding AI. The long-term plan of this workshop is to update it every summer and every winter to ensure we're staying up-to-date with the latest developments. The workshop's content covers introduction to terminology, how generative AI works, the pitfalls of hallucination, environmental impact, potential use cases, and plenty of interactive elements to keep the audience attentive and involved. This workshop is run once a semester in the library as a set event, but can also be offered to individual classes, tailored specifically to their subject material. Additionally, we have partnered with various campus organizations to give this presentation at a campus-wide staff and faculty development day, and plan to offer it at other events in the future. Beyond our in-person presentations, we offer a pre-recorded version of the workshop on our library's YouTube channel, allowing for people to watch the content at their own pace, or revisit it if they attended an in-person session.

CALL TO ACTION

Higher Education and Libraries

Instructors should be clear about their personal stance on AI in their syllabus, both in terms of their personal use of the technology, as well as outlining their policies for students' use. They should provide resources to their students so they can further their understanding of the technology and its uses and downfalls, and support their students' unique learning styles in the process. By starting on an instructor-by-instructor basis to promote AI Literacy, students will be able to better form their own opinions on the technology. Libraries can supplement this AI Literacy initiative by creating workshops to present at classes, providing examples of how to use or not use AI in research practices.

Communication and Literacy

When it comes to communication and literacy, you should be paying attention to what social media platforms you use and look into their stances on AI. Determine if they are taking your posts to train their AI, and figure out your stance on their methods. Before you go to ask an AI chatbot a question, ask yourself if there's an alternative method to get the information. Could you use Google? Could you ask a friend? While AI is a tool that can assist with a variety of tasks, you shouldn't become solely reliant or dependent upon its use.

CONCLUSION

At our library, we have worked to foster an environment that promotes an open learning experience in which to deliver AI literacy education to our faculty, staff, and students. By keeping ourselves educated on AI topics, we are better prepared to help others shape their opinions on the technology. This work takes a distinctive approach to AI literacy, focusing not just on scholarly work, but a holistic view of all relevant media. The key takeaways from this should be the following: Libraries can be a hub for AI Literacy education in higher education spaces; Keep yourself educated about AI developments; Advocate to your higher ups about the importance of AI and Information Literacy; Don't become overly reliant on AI for the completion of work or communicative tasks. "But you can't *make* people listen. They have to come round in their own time, wondering what happened and why the world blew up around them" (p. 146, Bradbury, 1951).

GENERATIVE AI USE

I confirm that I did not use generative AI tools/services to author this submission.

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Investigating the Existence of AI Policy in Higher Education Institutions in Sub-Saharan Africa

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ABSTRACT
The rapid advancement and adoption of generative artificial intelligence tools in academia have raised critical questions regarding policy readiness and ethical governance, especially in Higher Education Institutions (HEIs) across the Global South. This study investigates the existence of institutional AI policies in three Sub-Saharan African HEIs and explores their implications for academic activities. Using the Times Higher Education rankings, we selected the top ten HEIs in Nigeria, Ghana, and South Africa each. We first used structured website content analysis across institutional portals, graduate school portals, and library webpages to identify published AI policies. This digital audit was supplemented by follow-up informal interviews with key university personnel to verify the existence or absence of such policies. Guided by our preliminary research questions, preliminary findings show that while a six HEIs in South Africa have published and implemented institutional AI policies, no HEI in Ghana or Nigeria currently has a formal or publicly accessible AI policy in place. In these countries, academic staff use their discretion to make subjective judgments when evaluating student submissions suspected to be AI-generated. This creates inconsistencies, which in practice raises concerns about fairness, transparency, and accountability. Given the rise in legal disputes between students and institutions globally concerning the use and evaluation of generative AI in academia, our study underscores the urgent need for policy development in African HEIs.

KEYWORDS
AI policy; Generative AI; Higher Education Institution

INTRODUCTION
The adoption/use of Generative Artificial Intelligence (GenAI) by students in higher education has brought about significant opportunities and challenges (Cacho, 2024; Neupane et al., 2024). While there is a lag in comprehensive national policy governing the use of GenAI in Africa (Maina et al., 2024; Njoroge, 2024), institutions are exploring strategies to harness its potential benefits and challenges to preserve academic integrity and standards (Abubakar et al., 2024). For instance, there have been calls for the integration of GenAI to enhance hands-on teaching and assessment (Nyaaba & Zhai, 2024). Similarly, a study focusing on Ghana has highlighted the positive impact of GenAI on students' understanding of course materials, with 72% of participants reporting improved comprehension (Wiredu et al., 2024). However, Wiredu et al. (2024) also revealed significant concerns about academic integrity, with 75% of students citing it as a primary issue. This is why it is important for universities to have policies that guide students on the ethical use of GenAI (McDonald et al., 2025; Barus et.al., 2025).

Consequently, lack of institutional GenAI policies has left students with no guidelines on the ethical and responsible use of GenAI tools (An et al., 2025). Students often view GenAI as a tool to overcome academic challenges, thereby highlighting the need for formal institutional policies on its adoption (An et al., 2025; Duah & McGivern, 2024; Zlotnikova et al., 2025). In sub-Saharan Africa, students are increasingly relying on AI tools, especially GenAI, for assignments, research, and exam preparation, raising concerns about the integrity of students' academic writings and capacity (Abubakar et al., 2024; van Niekerk et al., 2025; Wiredu et al., 2024). Therefore, lack of policy guidelines has led to ethical ambiguities, with students often having differing perceptions of what constitutes academic misconduct and integrity when using GenAI (Duah & McGivern, 2024; Song, 2024; Wiredu et al., 2024). Another implication of lacking GenAI policies is the potential erosion of critical thinking skills leading to cognitive debt among students (Kosmyna et al., 2025). Similarly, over-reliance on GenAI tools for generating content and solving complex problems has led to concerns about the decline in students' ability to think critically and independently (Chiu, 2024; Neupane et al., 2024; Wiredu et al., 2024; Song, 2024). This trend is particularly concerning in Ghana and Nigeria, where the educational system has traditionally emphasized rote learning over critical thinking (Nyaaba & Zhai, 2024; Bello et al., 2025). Developing comprehensive institutional policies on GenAI is essential to address the challenges and manage opportunities posed by these technologies (Wang et al., 2024). Therefore, institutions should prioritize creating guidelines that clarify the ethical and responsible use of GenAI in academic work (McDonald et al., 2025; Baha & Okolo, 2024; Wiredu et al., 2024). These policies should be informed by the experiences of teachers and students, as well as global best practices in AI governance that balance the benefits and challenges of AI technologies (Duah & McGivern, 2024; Cacho, 2024; Njoroge, 2024; Dabis & Csáki, 2024).

Consequent to the scholarly narratives above, this study is significant as it investigates the state of GenAI policy for promoting academic integrity and critical thinking among students in three African countries. In the Global North, previous studies have examined institutional GenAI policies and guidelines in higher Education (McDonald et al.,

2025). However, despite the growing academic discourse on the use of GenAI for academic purposes and efforts by universities in proactively addressing issues in the adoption of GenAI (Jin et al., 2025), there is a dearth of studies on institutional GenAI policy from Africa, especially the three countries highlighted above. Although Oyelere and Aruleba (2025) found a positive attitude toward AI-driven technologies for personalized learning, Zlotnikova and Hlomani (2024) noted that it threatens academic integrity in African university contexts. Therefore, this study is significant because of its novelty and potential to expose African universities to the need for urgent actions on designing institutional GenAI policies in conformity with practices in the Global North for promoting academic integrity and critical thinking among university students.

METHODOLOGY

This study employed a purposive sampling approach to select 30 universities in Ghana, Nigeria, and South Africa. Specifically, the inclusion criterium is to select only top ten (10) universities in each of the three countries using the 2024 Times Higher Education (THE) rankings. This criterion was used in selecting the institutions considering the parameters which include stewardship, research environment, research quality, and international outlook (Times Higher Education, 2024) used by THE for ranking universities globally. Therefore, the study assumes that the top 10 universities in the selected countries most likely have robust policy frameworks that guide students on using GenAI for academic activities. The study adopts a two-stage data collection process comprising web-audit and unstructured interviews. As an exploratory pilot study, informal interviews were conducted without undergoing formal institutional review board (IRB) review since no personally identifiable or sensitive information was collected at this stage. A thorough examination of various elements on the selected university main websites, graduate schools web pages, and library portals using the site embedded search features to identify any publicly available GenAI policies guiding students' scholarly activities. This multi-level method is aimed at establishing the availability of comprehensive policy guidelines by institutions, their accessibility by students on designated university websites, and the assessment of the digital presence of AI governance structures. To substantiate the early findings obtained from web auditing, the authors conducted preliminary unstructured interviews with contacts from relevant units and provided additional contexts to authenticate the availability or absence of GenAI policies at the selected universities.

FINDINGS

The analysis revealed notable differences in the status of AI policy development among HEIs across the three countries studied. In South Africa, a few HEIs have established and publicly accessible AI policies, while others are in the process of developing one. In contrast, none of the HEIs examined in Ghana and Nigeria currently have a formal institutional AI policy. In Ghana, for instance, only three institutions indicated they are in the early stages of policy development. In the absence of formal policies, academic staff often rely on personal discretion to assess student submissions suspected to be AI-generated. This reliance on subjective judgment has, in some cases, led to tensions and misunderstandings between faculty and students. The findings also highlight a lack of familiarity among some faculty members, particularly in the humanities and social sciences with tools and techniques for detecting AI-generated content. The findings attributed the absence or delay in policy implementation to several structural and institutional challenges, including large student populations, limited financial resources, and bureaucratic inertia. These findings underscore the urgent need for comprehensive and transparent AI governance frameworks in Sub-Saharan African HEIs to ensure fairness, consistency, and accountability in academic practices.

CONCLUSION

This study investigates the availability and implementation of generative AI policies in top universities across Nigeria, Ghana, and South Africa. By analyzing institutional websites and following up with key stakeholders, we found that only a few South African HEIs have formal AI policies, while Ghanaian and Nigerian institutions largely lack them. In the absence of policies, faculty rely on personal judgment for handling suspected AI-generated work, raising concerns about fairness and consistency. Our research highlights a critical policy gap and offers evidence-based insights for guiding ethical AI governance in African higher education. This study offers an initial look at generative AI use in HEIs but is limited by its pilot scope, small sample, and informal interviews. Since this study is exploratory in nature and is not intended to make any generalizations or definitive conclusions, our future research will be expanded by including more institutions across countries in Sub-Saharan Africa and in-depth interviews.

GENERATIVE AI USE

To support clarity and language quality, we used ChatGPT to correct minor grammatical errors in my writing, as I am not a native English speaker. Additionally, we used SciSpace AI to scan and explore related academic papers for contextual understanding. All generative AI outputs were critically reviewed, verified for accuracy, and used strictly as writing support tools. The intellectual contributions, analytical interpretations, and research design are entirely our own. We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author (Cudjoe, E): conceptualization, methodology (equal), data curation (lead), formal analysis (lead), writing – original draft, writing – review and editing (supporting). Second Author (Adebayo, J): formal analysis (supporting), methodology (equal), data curation (supporting), writing – review and editing (lead)

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Technological Mediation of Trust in Grassroots Organizations: A Case Study of Social Network Platforms

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ABSTRACT

Trust is essential for collective action in NGOs and grassroots organizations, yet Social Networking Platforms (SNPs) complicate these dynamics. Drawing on technological mediation theory, this study proposes a Technological Mediation of Trust (TMT) model to analyze how SNPs influence trust among communities, allies, and institutions. The model integrates psychological (subjective) and sociological (objective) dimensions of trust. Preliminary findings reveal a dual effect: while SNPs can enhance trust by showcasing local efforts, they predominantly hinder trust-building with bridging and linking capital networks and amplify distrust toward external entities. By exposing tensions between digital visibility and relational authenticity, the TMT model offers a framework to navigate risks to trust in digitally mediated grassroots collaboration.

KEYWORDS

Technology mediation, Trust, Social Networking Platforms (SNPs), Social Capital, Planned Behavior Theory

INTRODUCTION

Undoubtedly, new technological artifacts, systems, and platforms can have a major impact on the social context of any community. In his book Bowling Alone, Putnam points out how technology has fueled individualization and ultimately the erosion of the American community (Putnam, 2000). This research is interested in trust as a specific factor essential for navigating social life (Luhmann, 1973), which can be directly affected by the adoption of different technologies (Ashmore & Restrepo-Forero, 2013; Brennan, 2021; Danaher & Sætra, 2022). Specifically, it examines how socio-technical designs interact with trust in grassroots organizations, which play a vital role in fostering local networks and collective action. Drawing on technological mediation theory (Verbeek, 2005), this study analyzes the social impact of SNPs within grassroots organizations, at *El Distrito* in Cali, Colombia.

THEORETICAL FRAMEWORK AND METHODOLOGY

This study builds on technological mediation theory, which posits that technology does not directly determine reality but instead mediates how individuals perceive and interact with the world (Verbeek, 2005). The proposed model extends Verbeek's framework to examine how technological mediation affects trust (Delgado Ramos, 2023). It conceptualizes mediation as a process that can amplify or diminish trust-related beliefs, while also inviting or inhibiting behaviors that contribute to trust-building.

To further specify the mechanisms of this mediation, the model incorporates PBT—Planned Behavior Theory (Ajzen & Fishbein, 2018). This theory identifies three key belief structures that guide behavior: perceived behavioral control, subjective norms, and trust evaluations—such as perceptions of benevolence, integrity, and competence. These beliefs can be reinforced or weakened through interactions with SNPs, which mediate the conditions under which trust is formed and maintained.

Additionally, the model identifies the specific forms of social capital (Putnam, 2000) that SNPs can either foster or hinder. These include: the connections among individuals that create positional capital; the explicit and sustained obligations that build obligation capital; and the mechanisms through which systems exert control and establish moral legitimacy (Castiglione et al., 2008). Examining these mediated elements provides a framework for understanding how SNPs influence both system and relational trust by shaping the relational and systemic forms of capital.

Case Study

To analyze phenomena resulting from mediation, scholars often rely on context-rich case studies (Aagaard & Ihde, 2018). This research is situated in Colombia, a country ranked second-lowest globally in interpersonal trust (Haerpfer et al., 2022), where armed conflict (Comisión de la Verdad, 2022) and inequality (World Bank, 2022) have contributed to the erosion of trust (Uslaner, 2008). In urban centers like Cali, the displacement of ethnic groups and the arrival of Venezuelan immigrants have led to the formation of new marginalized communities, such as *El Distrito*. Despite seeking opportunity, residents face ongoing challenges including racial discrimination and xenophobia (Alvarez, 2023; Martínez, 2023).

This study examines how SNPs mediate trust within El Distrito, focusing on the community surrounding the grassroots organization Aprender, Crear y Crecer (ACC), which serves up to 100 daily attendees—including children, seniors, and recyclers. The organization faces persistent challenges such as low reciprocity, limited

government support, and institutional distrust (Alvarez, 2023). Additionally, digital stigmatization of the neighborhood through SNPs (Burbano Cerón & José Eduardo, 2021; Montes Martínez & Sánchez Salcedo, 2021; Soto Narváez & Guerrero Caicedo, 2021) further impedes collaboration. While deeply situated in the Colombian context, this case offers insight into how SNPs mediate trust in grassroots initiatives within marginalized urban settings—insights that may resonate with organizations operating in contexts marked by generalized distrust and digital stigmatization elsewhere.

RESULTS

I conducted 18 interviews and recorded field notes based on observations of both in-person and online interactions across 60 activities, over a six-month period from March to September 2024. Drawing on Rosenberger's (2014) methodology, the field notes captured the adoption and contextual stabilization of SNPs by documenting observed behaviors, program roles, and community adaptations. The interviews explored trust from two perspectives: its subjective dimension, through open-ended questions referring to elements of the Theory of Planned Behavior (TPB), and its objective dimension, through a network drawing activity. This activity combined Robbins' name generator method (2023), Hogan et al.'s ego network visualization approach (2007), and Jason et al.'s trust relationship characterization (2014) to illustrate each participant's ego network. Each ego network included three types of connections with alters, with their weights based on different factors: how frequently participants interacted with each alter, for interaction links, how many dimensions of trust they reported, for trust links, and how often interactions occurred through digital platforms —for digital links. A missing link indicated no interaction, no trust, or no digital contact, respectively.

Associations between these networks were examined using the Quadratic Assignment Procedure (QAP), with all observed correlations showing high statistical significance based on 2,000 permutations ($p < 0.0005$). As expected, frequency of interaction and digital interaction networks were very strongly correlated (QAP = 0.84), reflecting that the general interaction network also included digital exchanges. Trust and interaction frequency were also strongly correlated (QAP = 0.58), while trust and digital interaction showed a moderate correlation (QAP = 0.51). However, in a Multiple Regression QAP with trust as the dependent variable, the coefficient for digital interaction (0.03) was an order of magnitude smaller than that for general interaction frequency (0.32), indicating that, in this context, digital interactions appear far less influential in building trust than traditional face-to-face interactions.

Furthermore, the qualitative analysis of field notes and open-ended interview responses suggests that SNPs can undermine trust with organizations or institutions, when representatives distort reality or misrepresent community contributions in digital posts. For example, in Interview 16, a former ally and concerned community member remarked, "I realized that it was just politics, for the mayor or to receive economic aid. Saying 'look what I'm doing for the commune'... I saw it many times. They took photos and shared them here, shared them there, but nothing was done for the community." There is particular distrust toward data collectors, as people fear the misuse of their names or images. "They have taken the community data! They set up an NGO to collect all the data... from 20, 30 to 40 people to do who-knows-what with it," said a beneficiary from ACC in Interview 18, explaining why many avoid affiliating with NGOs. Some participants suspect that their data is used to falsify participation and benefit external organizations or politicians, as noted by an ACC mobilizer in Interview 4. These concerns reflect a broader expectation that institutions and external agents manipulate digital content to serve their own agendas, ultimately diminishing perceptions of integrity and benevolence and weakening trust intentions.

However, SNPs can also strengthen trust by encouraging the publication of local pro-social activities—such as street cleaning and community gardening—and highlighting key alliances. This visibility fosters perceptions of benevolence. For instance, an ACC beneficiary in Interview 8 shared, "I feel good because they are taking me into account. It shows that I'm participating in these opportunities." Moreover, SNPs like WhatsApp chats can validate leaders' influence by demonstrating their bridging capital. For example, the ACC leader frequently shares audio messages and texts from decision-makers addressed to her personally, reinforcing her role as a trusted intermediary.

CONCLUSION

The triangulation of qualitative and quantitative findings indicates that the role of SNPs in shaping trust depends on the type of social capital involved. Digital interactions made a statistically significant but modest contribution to trust, complementing—rather than replacing—the stronger effect of frequent in-person contact, which remains central to sustaining local bonding capital. Trust in intermediaries and institutional representatives in digital spaces was often fragile, as these interactions were frequently perceived as serving personal or political agendas rather than the community's interests. Without a consistent local presence, such digital exchanges risk widening the gap between community members and external actors, potentially undermining bridging and linking capital. By contrast, when SNPs were used to publicize genuine local pro-social activities, recognize participants, and reinforce the role of trusted local leaders, they helped strengthen perceptions of benevolence and credibility. These results suggest that

effective SNP strategies should be designed to complement face-to-face engagement, incorporate safeguards against online misrepresentation, and create visible and formal acknowledgment of community contributions.

GENERATIVE AI USE

I confirm that AI tools were used solely for language editing and stylistic improvements in this submission. No AI was employed in the analysis or interpretation of research data.

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Chinese Antiquities in U.S. Museums: Online Collections Databases and Open Data Quality

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ABSTRACT
Bringing museum information resources online benefits the public and researchers. Despite decades of digitization, open access, and collaborative data sharing initiatives, few empirical studies have evaluated information retrieval effectiveness and open data quality. This poster uses web-based content analysis and a case study to review over 180,000 Chinese antiquities in 61 U.S. museums. Findings reveal intertwined curatorial and cataloging practices, challenges around the structural-flexibility tradeoff, and limited inter-institutional data interoperability. This poster contributes to the digital curation of non-Western cultural objects, digital scholarships, and provenance research.

KEYWORDS
Museum Informatics; open data; collection access; digital cataloging; provenance.

INTRODUCTION
Ancient Chinese artifacts came into institutions abroad through export, cultural and religious transmission, unregulated trade, and looting. American museums now hold a significant portion of Chinese antiquities abroad. Modern museums serve as information service organizations; digitizing descriptive data and bringing museum information resources online have dramatically facilitated education and research despite physical distance (Marty, 2017). This poster presents a preliminary review of the current state of digital museum collections—particularly the textual data, largely guided by the Categories for the Description of Works of Art (Beca & Harping, 2024) and the Cataloging Cultural Objects (Beca & Visual Resources Association, 2006). This poster evaluates their public accessibility, their value as primary sources for digital scholarship, and their potential for interoperability within the museum community. The research questions are as follows: RQ1. Which U.S. museums and which of their curatorial departments have notable collections of Chinese antiquities? RQ2. What is the current state of digitization and open access for these collections? RQ3. How do database information systems, cataloging metadata, and controlled vocabularies affect their accessibility and usability? RQ4. To what extent is open data on Chinese antiquities in U.S. museums prepared to support digital scholarship, including quantitative analysis?

METHODS
This study began by identifying U.S. museums with notable Chinese antiquities collections based on historical research, which together mentioned 62 museums (Meyer and Brysac, 2015; Rujivacharakul, 2011; St. Clair, 2016; Steuber & Lai, 2014; Tomkins, 1970). After accounting for institutional changes such as the closure of the Corcoran Gallery of Art (Montgomery, 2014), a final list of 61 museums was compiled. These early collecting museums acquired pieces through donations and purchases from collectors and dealers specializing in Chinese art. In contrast, institutions primarily involved in more recent acquisitions without documented historical provenance were excluded, as this study does not focus on the contemporary American secondary market. In the second step, this study systematically reviewed each museum's cataloging of ancient Chinese artifacts dated before 1912, the year the Republic of China was proclaimed, and the Qing Dynasty ended. A web-based content analysis was conducted through searches performed on museum online collections pages and documentation of results. Descriptive statistics and data visualizations were then used to analyze museum distribution, collection size, open data availability, metadata quality, and vocabulary usage. As a further step, this study examined the provenance field in the Cleveland Museum of Art's open-access data from its GitHub repository. The dataset contains 2,487 objects from the museum's Chinese Art Department in JSON format. The poster analyzed the data structure and parsed it into machine-readable, structured records—extracting each ownership agent and transfer type—using a workflow designed to maximize both accuracy and automation. Data values were also reviewed to evaluate their consistency and quality in supporting quantitative provenance research as part of the broader digital humanities infrastructures.

FINDINGS
Among the 61 museums identified, seven specialize in Asian art, three are natural history museums, and nineteen are university museums. Six museums do not have online databases. Of these, three provide estimated or highlighted counts of Chinese artifacts. The American Museum of Natural History anthropology database has been under system maintenance for over one year. The Cincinnati Museum of Art's database lacks pagination, requiring users to continuously click "Load More" without a clear indication of the endpoint. Figure 1 shows the distribution of over 180,000 Chinese antiquities across institutions, with the Field Museum in Chicago having the largest collection despite being a natural history museum. However, a mismatch exists between its online database records and the figure published in its press releases. Moreover, none of the three natural history museums offer filters for works on view. Registration differences between art and natural history museums impact retrieval design and data integration.

This study observed wide variation in how museum databases support search for Chinese antiquities. Users often need information literacy to navigate search fields, especially when free-text input is required in the absence of predefined dropdown options. Institution-specific information organization is common, but this also raises critical questions about the definitions and curatorial rationales of concepts like 'Chinese Artifacts' or 'Objects from China.' Nearly half (N = 29) of the museums provide advanced search based on geographic location, with terms from 'Where Object Was Made' to more traditional ones like 'Place,' 'Country,' 'Geography,' 'Origin,' and 'Region.' When geography-based search is not supported, eleven museums use culture- and nationality-based searches. At nine museums, 'Department' or 'Curatorial Area' is the only available choice. Inconsistent cataloging specificity and the lack of linked hierarchy in vocabulary lead to search results that exclude objects described with more specific terms. For example, when museums use provinces, archaeological sites, ethnic minorities, or dynastic and reign periods, these are frequently treated as parallel to, rather than nested within country and culture. This issue, along with overlapping terms, extends to other metadata fields including artwork type, styles, subjects, and classifications. While curatorial areas are independent of cataloging practices, Chinese antiquities are sometimes categorized based on their intended export destinations, and other times by material or function. Figure 2 illustrates the intertwined categorization between geographic origin, culture, and curatorial departments. Objects with range-based date displays that span 1912 often result in exclusions from both pre- and post-1912 time-based searches.

Public access to museum databases typically relies on web-based interfaces. The quality of search results is highly dependent on users' familiarity with database structures, data content standards, and retrieval tactics. Without transparency, the precision and recall may be compromised. Thirteen museums provide open access to their collections data with documentation websites. Eleven of these museums host GitHub repositories, nine have released APIs, and twelve offer JSON or CSV files. Although this approach meets only the third level of the five-star cumulative system standard for linked open data (W3C, 2013), it remains practical for bulk downloads, individual and offline analysis, and application development. Andrew W. Mellon Foundation funded the American Art Collaborative linked open data for fourteen museums, but Chinese artworks were largely excluded.

In Cleveland Museum of Art's JSON dataset, each of the 2,487 Chinese antiquities includes a provenance field structured as a list containing zero or more dictionaries, each representing an ownership transfer with four attributes: description, citations, footnotes, and date. While citations and footnotes are mostly empty, the description field follows a relatively consistent syntax—typically: Owner/Agent name, City, State/Country + ', ' + Transfer Mode + Owner/Agent name—allowing to be parsed into 3,354 adjacent pairs with 'from,' 'to,' 'transfer mode,' and 'date' attributes, as shown in Figure 3. However, several issues persist: 1) 674 artifacts lack prior provenance before acquisition by CMA, though relevant data appears in the credit line field; 2) 205 records are missing CMA as the final owner, and many combine multiple collectors into a single dictionary; 3) inferred transfer, such as between "Mr." and "Mrs." or individuals and their companies, disrupt the expected overlap continuity between consecutive records; 4) while relatively few, ambiguous transfer phrases like "Acquired in" or "Purchased with funds from" do not indicate clear ownership chains and require manual review; 5) many of the 1,131 "unique" ownership agents are duplicates caused by inconsistent naming. The following issues should be addressed for consistency: spacing, capitalization, punctuation (e.g., commas, periods, parentheses, brackets, en dashes). Naming conventions should be standardized in middle names, full names, initials, women, couples, honorifics (e.g., "Dr."), non-English names, and corporate names. Dates of ownership should appear only in the 'date' field. Information from auction houses, including lot numbers, should be recorded consistently, and placed in a designated field.

CONCLUSION AND NEXT STEPS

Most of the 61 museums offer stable online databases, yet these often function as "black boxes" with inconsistent data quality. While classical information retrieval models (Bates, 1989; Belkin, 1980) emphasize cognitive uncertainty and exploratory behaviors, data-driven users of bounded and finite museum systems require comprehensive and transparent data access. Pioneers in the museum open data movement have set exemplary practices, but full potential to support digital scholarship has not yet been realized. Improving descriptive data and separating structured from ambiguous and flexible information (Nurmikko-Fuller, 2024) are both essential for conceptual modeling and semantic infrastructure. Future research will incorporate user studies and investigate the roles of museum professionals as well as information system providers.

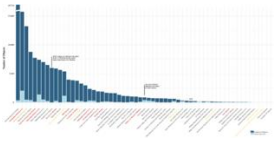

Figure 1. Chinese antiquities collection size and works on view by museum.

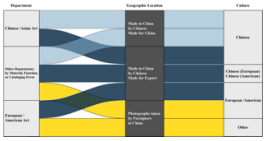

Figure 2. Illustrative representation of the categorization of Chinese antiquities in U.S. museums.

Figure 3. Network of provenance agents for Chinese Art at the CMA, based on uncleaned data.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

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Introducing Collections as Data in Postgraduate and Professional LIS Education

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ABSTRACT
The advancement of the 'collections as data' paradigm in libraries requires both library professionals and users of modern digital resources to acquire and use new skills such as data cleansing, visualization, and the use of Jupyter Notebooks, to name just a few. Introducing modules on datafication would contribute to the skills and knowledge of future library and information professionals. A new professional role – collection as data librarians – made its way into organizational structures. However, continuous professional development opportunities that support librarians in meeting the demands of this role are not yet widely available. This poster presents emerging evidence on the ways higher and professional LIS education respond to this shift in professional practice. We offer reflection from postgraduate modules from a University in Scotland. We also explore the emerging trends in professional training on collections as data. We hope to inspire a broader discussion on integrating collections as data knowledge and skills within postgraduate and professional LIS programs.

KEYWORDS
Datafication, AI, principles, pedagogical approaches, Jupyter Notebooks

INTRODUCTION
The growing number of libraries engaging with the collections as data (Padilla 2018, Padilla et al. 2018) paradigm requires rethinking current educational provision in librarianship and information sciences (LIS). Several components need to be considered in introducing new modules or refreshing existing ones: identifying the knowledge and skills needed in the professional practice, and also analyzing the emerging practices of using artificial intelligence (AI) tools in the collections as data domain and the areas where collections as data and AI can be introduced jointly. To the best of our knowledge, there has been no exploration of how collections as data enter LIS education, and AI is considerably more explored within this context. A search for *'collections as data' AND iSchools* returns some 100 entries on Google Scholar, while *AI AND iSchools* returns some 6900 sources at the time of submission.

Professional upskilling adds complexities to the question of how to deliver collections of data knowledge. The postgraduate and professional pathways differ significantly in their structure, delivery, and pedagogical approaches. This poster examines current examples of introducing the domain of collections as data in the postgraduate Library and Information Science (LIS) educational context, as well as in short training courses.

LITERATURE REVIEW
One of the relatively early publications mentioning collections as data within the context of curricula is CASRG (2019). While it explores a broad range of computational skills, collections as data are mentioned just once without any analysis of their place in curricula. ARL (2019) includes several articles on data literacy and data science in libraries and universities, but not on collections as data. Wittmann et al. (2019) explored some needs which should be answered by librarians, arguing that "With an increasing number of researchers experimenting with digital humanities methods, collections as data will be a standard consideration when working with new digitization projects". While curricula are not discussed, this argument suggests the need for upskilling. Khan (2020) analyzed 128 syllabi from the 2019 ALA database of LIS courses and concluded: "The results from this exploratory research show that LIS educators and curriculum developers are focused heavily on data analysis… More focus in the syllabi is given to data mining and not on data collection. Perhaps topics such as methods and metadata are least represented in data science syllabi as they may be covered under core course requirements or other LIS specializations." Furthermore, Chung et al. (2022) explored the Association for Library and Information Science Education (ALISE) statistical reports from 1997 to 2020 where datafication is not mentioned.

An additional insight into the emerging needs of LIS professionals is provided by the publications which explore the data-related skills identified by library staff and managers (Luo and Tang 2024). This brief review of the academic literature suggests that the discussion of the place of collections as data in LIS curricula has not yet reached maturity.

RESEARCH QUESTION AND METHODOLOGY
Our main research question is how education providers in LIS respond to the new needs emerging from the introduction of collections as data in the library practice. We explore both postgraduate and professional programs as complementary questions. For this pilot study, we are using a combination of desk research methods (analysis of

academic and professional programs and publications) and comparative analysis, bringing examples from a postgraduate program and emerging trends in professional training.

FINDINGS

In this section, we first explore one example of a postgraduate LIS program and several professional training programs and short courses.

New Trends in Including Collections as Data into Postgraduate Education

A module delivered at the University of Strathclyde focuses on practical skills in data analysis and designing Jupyter Notebooks. It aims to introduce LIS students to data literacy and provide examples of library services around datafied resources. The module introduces the current efforts in developing the European data space for cultural heritage. In addition, coding and data science prepare students for an assignment where the students select a library dataset, analyze it and deliver visualizations. The module also discusses the use of AI in analyzing catalogue data.

Professional Education Offering Including Collections as Data

There are several main avenues for professional education in the domain of Collections as Data: online courses, short courses delivered as satellite events at conferences, and the Library Carpentry.

An example of an online course is Candela et al. (2024), offered on DARIAH Campus. This is an introductory course which offers a range of useful links to practical tools which can be used within any institution, such as checklists (Candela et al. 2023), or the datasheet for digital cultural heritage datasets (Alkemade et al. 2023). Such modules, which look at the generic framing of collections as data, can be further complemented by modules on Python, Jupyter Notebooks and other computational environments which are used in data-intensive environments. The use of AI in cross-collection discovery (‘Yale colloquium…’ 2025) is just one example of a domain relevant to professionals that will require designated training.

It has been a common practice in recent years for such modules with a hands-on component to be offered at different specialized conferences. For example, experimentation with Jupyter Notebooks was offered at (EADH 2021). Library Carpentry offers a well-established CPD model (Library Carpentry n.d.). It aims to make technical training available worldwide to professionals in libraries, archives, museums, and other information and heritage sectors. While it is not explicitly focused on collections as data, some of its lessons are relevant, and it also allows expansion (we are currently discussing potential additional lessons).

The online modules and short events play a crucial role in spreading awareness of existing tools and providing a safe initial space for experimentation. For adoption, it would be useful to offer mentorship programs (we are currently discussing how to deliver such a program within the International GLAM Labs community, https://glamlabs.io/). This will support professionals in applying the new knowledge and tools they have become familiar with, evolving from awareness to engagement with collections as data.

A substantial difference in the mode of delivery of professional and postgraduate modules is that a university module is typically spread over 10 or more weeks, with academic staff available to mentor participants. In the case of short professional courses, this is not an option, and there is a definite need to find a delivery model that would provide longer-term support. A well-structured program such as the Library Carpentry, which is suitably supported with training materials, could be potentially extended to meet more of the collections as data skills and knowledge. A mentorship program would be an opportunity for individuals to progress from awareness to reinforcing new skills in the workplace.

CONCLUSION

While the paradigm of collections as data continues to spread wider in libraries and is a significant potential contributor to the cultural heritage data spaces and other large-scale infrastructures, the educational practice of introducing the relevant knowledge and skills is still patchy. Job adverts for data librarians still tend not to be very prescriptive on the specific skills needed in these roles and suggest a flexible mindset to adapt to needs, which will be identified along the way. This may, to some extent, reflect the lack of systematic education in this domain.

A significant challenge is the breadth of the domain, which can range from purely theoretical to highly hands-on programs focusing on specific skills, such as data tidying, creating datasheets to describe datasets, or identifying strategies for overcoming biases in AI-supported tools for data collection analysis. Data literacy is typically introduced as a set of specific skills for understanding data types and transformations, data analysis, and visualization. Collections as data brings these various areas of practical knowledge to a next level by discussing how libraries provide novel services around datasets. What content and delivery would be most useful remains to be analyzed further. We are currently preparing a survey to gather insights into new skills, including AI-related ones, from librarians, and to explore the emergence of datafication and AI modules within iSchools curricula.

Our aim with this poster is to foster discussion with colleagues and identify pathways for improving the content and the delivery of educational programs to support the onerous efforts in transitioning more libraries into collections as data.

GENERATIVE AI USE

No generative AI tools were used in writing this submission, but Grammarly was used to revise the text.

AUTHOR ATTRIBUTION

Milena Dobreva: Conceptualization (lead); writing – original draft (lead); writing – review and editing (equal). Gustavo Candela: Conceptualization and writing (supporting). Review and editing (equal).

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Paper Work: The Role of Documents in the Development and Uptake of FORTRAN

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ABSTRACT
This paper explores how documentation shaped the development and widespread adoption of the FORTRAN (FORmula TRANslating System) programming language. Drawing on documentality and genre theory, it examines how a variety of documents, such as reports, manuals, textbooks, and standards, collectively supported the emergence of FORTRAN as a sociotechnical system. Through a diachronic genre analysis, this study investigates what types of documents were created, when they first appeared, why they were produced, and how they responded to the needs of the FORTRAN community. The findings show documentation played a constitutive role in recruiting programmers and stabilizing the language. By focusing on how multiple documents function as a genre set, this paper considers how documentation structured knowledge, shaped participation, and coordinated work over time.

KEYWORDS
agency; documentality; FORTRAN; genre theory; history of computing

INTRODUCTION
This paper traces the history of the FORTRAN programming language from its initial proposal in 1953 to its standardization in 1966. FORTRAN is an important subject of study for several reasons. It was the first high-level programming language to be widely adopted (Ceruzzi, 2003; Lorenzo, 2019). Today, FORTRAN remains a key part of the high-performance computing infrastructure in science and engineering (Curcic, 2020; Kedward et al., 2022).

This study addresses two research questions: (RQ1) What kinds of documentation were created and used during the early development of FORTRAN? and (RQ2) How did these documents function within the broader social and technical contexts in which they circulated? Our analysis shows that different types of documents, or *genres*, played a crucial role in shaping the development and uptake of FORTRAN. Genres, such as reports, manuals, textbooks, and standards, responded to the various needs of programmers working in industry, government, and academic settings. This case study further develops the concept of documentality by broadening attention from single documents to the work that multiple documents do together.

THEORETICAL FRAMEWORK
The concept of *documentality* challenges the idea that documents are simply information containers (Day, 2000). Instead, it draws attention to how documents take part in shaping sociotechnical systems through their circulation, interpretation, and use (cf. Buckland, 2014; Day, 2019; Ferraris, 2012; Frohmann, 2012; Smith, 2012). According to this approach, documents have *agency*: they do work in the world by influencing activities and relationships between people, information, and technology. Buckland (2014) illustrates documentality through the example of a passport, which does its work not by storing or transmitting information, but rather by acting as evidence of a person's legal rights. The passport's agency lies in how it functions within systems of migration control, enabling or restricting a traveler's mobility. While this example is useful, it reflects a tendency in the documentality literature to focus on a single document. We argue that this narrow focus limits the analytical potential of documentality.

To better understand how documents exert agency, we need to consider how multiple documents work together. Returning to the example of international travel, mobility rarely depends on a passport alone. For example, visas, travel itineraries, proof of funds, and customs forms also play roles in enabling or constraining a traveler's ability to move across borders. This broader view aligns with *genre theory*, which emphasizes how documents often function as part of a *genre set* – i.e., a collection of documents that work together and circulate within a specific context (Devitt, 1991; Spinuzzi, 2004). By examining genre sets, we gain insight into how documents collectively structure activity and association. We follow this approach in order to explore how different types of documents associated with software development shaped FORTRAN by exerting varied but complementary forms of agency.

METHODS
We conducted a diachronic genre analysis that covered the period from FORTRAN's proposal in 1953 to its standardization in 1966. As Tardy and Swales (2014) note, this type of analysis "can demonstrate how genres change in response to evolving rhetorical contexts" (p. 170). Diachronic genre analysis allowed us to identify what genres the FORTRAN community created, when and why they were produced, and how they differed.

To identify documents created during this period, we searched multiple sources, including the ACM Digital Library, U.S. copyright filings, and collections held by institutions such as the Computer History Museum. We focused on

the first appearance of each genre to map the breadth of the genre set and better understand how each genre initially emerged in response to specific exigencies. This approach aligns with our research questions and theoretical framework, which emphasize the multiplicity and associativity of documentation. While individual programmers may have engaged with only portions of the genre set, we are primarily concerned with how documentation operated collectively to support FORTRAN as a sociotechnical system. For each document identified, we analyzed its form, content, and communicative function. We then drew on technical and personal accounts to situate these genres within the broader historical narrative of FORTRAN's development and uptake (e.g., Backus, 1978; Knuth, 2003; Lee, 1984a; Pugh, 1995). We recognize that individual genres, such as manuals or standards, changed over time. Although this study does not track those changes, we see this as a promising direction for future research.

CASE STUDY

In 1953, John Backus proposed the development of a new programming language to his manager at International Business Machines Corporation (IBM), Cuthbert Hurd. Backus argued that such a language could make IBM's computers more attractive to customers by reducing the time and effort required to program in assembly language. Hurd approved the proposal and provided Backus with a team to begin work on what would become FORTRAN. The following year, the team wrote a report outlining the language's design (IBM, 1954). The 29-page **technical report** served both as a specification for how the language worked and as a guide for its future development.

As the first version of FORTRAN neared completion, the team faced a new challenge: persuading programmers to use it. In 1956, IBM published the *Programmer's Reference Manual* written for experienced programmers. The 51-page **manual** detailed FORTRAN's syntax and was intended to help experienced programmers learn how to write programs in the language. Additionally, the team presented a paper at a major computing conference (Backus et al., 1957). The 11-page **scholarly paper** introduced FORTRAN and the design of its compiler, which was a groundbreaking and technically ambitious system at the time (Allen, 1981; Lorenzo, 2019). The paper functioned not only as a technical account but also as a persuasive text. It invited practitioners and researchers to consider FORTRAN, a high-level programming language, as a practical alternative to low-level languages like assembly.

To reach an audience beyond experienced programmers, IBM published the *Programmer's Primer for FORTRAN Automatic Coding System for the IBM 704* (1957). The 68-page **primer** was written for readers with little to no prior programming experience and included a number of step-by-step examples. In 1961, Daniel McCracken published *A Guide to FORTRAN Programming*, the first textbook on the language. The 96-page **textbook** offered detailed explanations of FORTRAN, along with exercises and solutions tailored to scientific and engineering problems, making it especially suited for educational settings.

By the early 1960s, FORTRAN had become the first high-level programming language to see widespread adoption (Pugh, 1995). However, this success brought new challenges. Because each FORTRAN compiler had to be tailored to a specific computer model, many different versions, or dialects, of the language were created and used. As a result, programs written for one computer often failed to run on another, even when both were made by the same manufacturer (Lee, 1984b; Metcalf, 2011; Pyle, 1963). This lack of interoperability created a significant barrier to reusing programs. To address this problem, the American Standards Association (ASA) formed a committee in 1962 to develop a standardized version of FORTRAN. The committee brought together representatives from hardware manufacturers, user groups, universities, and software companies (ASA, 1966). Its goal was to improve interoperability by exerting more control over compiler implementation. This led to the creation of the *USA Standard FORTRAN*, which became the first official standard for a programming language (Metcalf, 2011). The 36-page **standard** defined the structure and interpretation of the language and was intended for use by anyone building a FORTRAN compiler (Heising, 1964). Although the standard did not completely eliminate dialect variation, it represented a turning point in the governance of programming languages by introducing a standard to coordinate distributed technical work (Greenfield, 1984; Metcalf and Reid, 1991).

DISCUSSION & CONCLUSION

This historical analysis highlights the important role of documentation in shaping the development and uptake of FORTRAN. In response to RQ1, we identified a variety of genres created between 1953 and 1966 that each served a different purpose. The report, manual, paper, primer, textbook, and standard formed a genre set. In addressing RQ2, we found that the documentality of this genre set exerted at least two distinct forms of agency. First, documentation facilitated the recruitment of programmers by providing materials tailored to varying levels of expertise. Second, the standard helped reduce incompatibility between dialects by controlling the implementation of FORTRAN compilers, which supported the coherence and stability of the language.

The findings suggest that documentation is more than just a record of technical work; it actively contributes to the work itself. By tracing the documentality of FORTRAN's genre set, we highlight how documents structure knowledge, shape participation, and coordinate work. This approach invites further attention to the historical and material conditions under which documents are created and used, and to the collective agency they exert.

GENERATIVE AI USE

We, the authors, confirm that we wrote this manuscript without using generative artificial intelligence.

AUTHOR ATTRIBUTION

Samuel Dodson: conceptualization, investigation, supervision, writing – original draft, writing – review and editing; Jane Bartley: investigation, writing – review and editing.

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Mislabeling Debate as Discrimination: Unveiling Political Information Illiteracy in University Students

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ABSTRACT
This study presents an exploratory mixed-methods study investigating student perceptions of political ideological bias in university classrooms, directly addressing claims made by Turning Point USA's Professor Watchlist. Researchers surveyed undergraduate students at a large southeastern university, defining discrimination as negative impacts due to group membership and propaganda as flawed argumentation used to sway perceptions. While the majority of students reported no bias, those who did often confused normal classroom debates and differences of opinion with discrimination. The study also highlights that Republican students were more likely to perceive course content as discriminatory, whereas liberal students reported experiencing xenophobic language and stigmatization.

KEYWORDS
Intellectual freedom, student perspectives, social justice education, political information literacy, discrimination, academic discourse

INTRODUCTION AND BACKGROUND
In 2016 Turning Point USA (TPUSA) launched the Professor Watchlist which has the mission "to expose and document college professors who discriminate against conservative students and advance leftist propaganda in the classroom" (About us, n.d.). TPUSA was developed by then 18-year-old Charlie Kirk to "educate students about the importance of fiscal responsibility, free markets, and limited government" (Our Mission, n.d.). Both of these initiatives advanced Kirk's political career which led to a speaking engagement at the Republican National Convention and joining Donald Trump Jr. on his book tour. The Professor Watchlist asks students to identify professors who are reportedly promoting a liberal bias in the classroom through recordings. At the timing of writing, the Professor Watchlist has 324 people listed. Previous research on the Watchlist found that professors were added for not what they said in the classroom but what could be found publicly such as social media posts, newspaper interviews, or speaking engagements (Oltmann & Dowell, 2025). Moreover, those professors on the watchlist do not see a broad, systemic bias against conservative students (Oltmann & Dowell, 2024) and Students don't mind professors expressing political views (Liebertz & Giersch, 2021).

Political literacy includes several concepts such as knowledge of human rights and constitutional protections, and it also includes the participation of public debate (Perveen and Awan, 2017). However, in modern U.S. secondary education debate is not necessarily taught as a skill to develop through a critical lens. It is understood by students to only increase partisan lines and feel like an argument rather than a discussion (Lowery, 2023). It is possible that the shift from viewing debate as a civic skill to that of silencing or indoctrination could be understood as why undergraduate students are hesitant to engage in political discourse.

The managers of the Professor Watchlist argue that "college professors discriminate against conservative students and advance leftist propaganda in the classroom." To explore this claim, we first define the concepts of "discrimination" and "propaganda." We define discrimination as the negative impact of information regarding an individual's group membership (e.g. students' political leanings) on how they are perceived and treated (e.g. by university professors). This can result in differential or unequal treatment (e.g., hostile classroom atmosphere, inconsistent rubric or grading enforcement, microaggressions, public shaming, silencing and othering, discouraging open debate, intimidation) (Levin, 1982; Wenz, 2020). We define propaganda as the deliberate, systematic use of seemingly persuasive but flawed argumentation (by university professors) to shape (students') perceptions and behavior in ways that further the propagandist's intent, thus undermining democratic deliberation (Jowett & O'Donnell, 2019; Stanley, 2015). With these definitions in mind, we surveyed students to investigate whether they have experienced bias and discrimination in the classroom, and if so, to understand how.

METHODOLOGY
This mixed methods exploratory study investigates student perceptions of political ideological bias within the classroom and campus environments. Researchers gathered data from undergraduate students at a large southeastern research university during the Spring 2025 semester. Participation was voluntary, with students recruited through a student research requirement in a variety of classes and offered the choice to complete a writing assignment instead of participating in research projects listed on a college-wide platform. Students received research credit counting towards their grade for completing the study.

In total, 312 students participated in the study primarily aged 18-22 with nine people 23 and older. The participants identified themselves as 32% liberal (Democrat, liberal, socialist), 44% conservative (Republican, conservative), 18% independent (independent, Libertarian), and 5% other (does not participate, moderate).

Researchers employed grounded theory for its capacity to develop insights directly from the data. There were two rounds of open coding, the first was to identify the overarching themes and to develop coder consistency and the second was to code the responses.

RESULTS

This poster investigates a pair of questions from the survey that focuses on student perspectives in the classroom.

Q1: Have you experienced bias or discrimination in your classes as a _[Selected Choice of Political Affiliation]_?
Q2: If so, what happened?

For Q1, 13% (n=41) reported Yes, 9% (n=29) reported Maybe, and 78% (n=239) reported No. Through two rounds of coding, the researchers developed 13 codes that summarized the quotations. The following five codes are those with the highest number of appearances in the 72 responses of either Yes or Maybe.

Code	Example Quotes
Course content (n=4)	In healthcare we only hear the democratic viewpoints
Debate as discrimination (=7)	By voicing my opinion on a topic in my social work class a lot of people gave me dirty looks and argued rather than hear me out and have an open clear discussion
Difference of opinions (n=22)	We had a political discussion, and it got heated after Trump and the Republican party got brought up.
Does not know what discrimination is (n=9)	One of my teachers told us we had to pick a side
Self-censorship (n=10)	I like to fly under the radar when it comes to politics. My opinions don't align perfectly with either side, so it tends to be better if I don't bring it up.
Speculation of grades (n=15)	Told my opinion on politics and received a worse grade.
Xenophobic language (n=4)	A student referenced trump sending back “Mexicans” to their country. I am Mexican and was born and raised here.

Table 1.

To normalize the numerical data from open coding, a z-test was conducted to determine whether the mean significantly differed from the standard deviation. We evaluated this data based on political affiliation and code. The pairs with a z-score of 1.9 or greater are: Republican and course content, speculation of grades, difference of opinion, and professors expressing opinions; Liberal and xenophobic language, and Democrat and stigmatization.

DISCUSSION AND CONCLUSION

The researchers seek to learn if the mission of the Professor Watchlist, “college professors discriminate against conservative students and advance leftist propaganda in the classroom,” applies. While the majority of the students report no discrimination or bias of political affiliation in the classroom, those reporting Yes and Maybe have a limited understanding of the concept of discrimination. Students tend to confuse discussions around debate and differences of opinion within the classroom as acts of discrimination.

Furthermore, our data reveals a correlation where Republican students are more inclined to characterize course content as discriminatory. In contrast, it is the liberal students who reported specific incidents of xenophobic language and stigmatization directed at them.

The work presented here is in-progress and requires further, more nuanced analysis to identify the trends in classroom interactions which is underway. What we see from our initial results is a deep misunderstanding of how to critically examine personal political concepts and discuss them in a way that feels productive and validating. The civil skill of debate is one that needs to be taught again in secondary education and continued in higher education. We also think the increased hostility in public discourse has reframed topics like Public Health, History, Science, and Technology as deeply divisive political, which may be fueling students’ discomfort in the classroom. On one side of the spectrum, a sense of loss of status and cultural dominance (not actual discrimination), and on the other lived experiences of microaggressions and exclusion.

We fully acknowledge that the current political landscape does not feel safe, particularly for minoritized students in a culturally conservative dominant state where this study took place.

GENERATIVE AI USE

The researchers utilized Grammarly for grammatical corrections and NotebookLM to write the first draft of the abstract, which was then edited for clarity and accuracy.

AUTHOR ATTRIBUTION

Meghan Dowell: conceptualization, methodology, data curation, formal analysis, writing – original draft, writing – review and editing. Fatima Espinoza Vasquez: formal analysis, writing – original draft, writing – review and editing.

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Visual Semantics of Social Movements Online: ML/AI and Network Analysis for Social Media Messaging

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ABSTRACT
Social movements have been using social media to share their narrative which supports their goals, values, and grievances, and it usually spreads across platforms in visual form. This research looks at how social movement images are structured into a narrative based on their visual semantic relationships. In the methodology, the images go through feature embedding, and zero-shot captioning to create a network of semantic relationships. These relationships are represented in an ontological network where the labeled images are nodes and their descriptions are the edges semantically connecting them based on similarity scores. This network is analyzed using the Leiden community detection algorithm to understand the latent visual semantics supporting social movement images. Comparing the feature labels and visual semantic image captions graph to a graph of semantically similar images proved to be somewhat difficult for domain-specific images like social movements. The analysis shows the various nuanced themes that arrive even within grouped classes.

KEYWORDS
Social Movements, Social Media Images, Generative AI Captioning, Leiden Agorithm, Community Detection

INTRODUCTION
As a global society living in the digital age of rapid information transfer, it is difficult to know what is actually going on around the world, or even in our backyard. Specifically, consuming news about a specific social movement online is difficult to follow and lacks a coherent narrative message. There are various ways to be informed about a movement's grievances and values, and the way the messaging is presented to an audience can change over time. Understanding what is being circulated online can support how decisions are made across various organizations (gov, NGOs, SM groups). It can also help us understand how the public consumes information on the issue which informs how practitioners share their messaging campaigns.

This project introduces a novel machine learning combination approach to analyze fragmented visual narratives surrounding online social movements. For the purposes of this research, visual narratives are defined as a means of producing and communicating knowledge (Josephson, Kelly, and Smith 2020). In the context of social movement research there has not been much attention on using machine learning to understand messaging campaigns, particularly based on the message's visual semantics. By using a collection of topical images found on social media, this approach of combined models can identify how a narrative is presented through visual semantics.

Analysis Framework
The framework implemented here first uses the CLIP (Contrastive Language Image Pre-Training) model to get image feature embeddings and then cluster the images into predetermined tags (Radford, 2021). Then, the images are put through a vision-language pre-training model BLIP2 (Bootstrapping Language Image Pre-training) to caption images (Li et al., 2023). The image captions found using BLIP2 are then clustered based on a cosine similarity and used to create a network where the nodes are represented by the tags found using the CLIP model, and the edges are represented by the weighted scores found by clustering the captions. The network is then analyzed using the community detection Leiden algorithm the iterative partitions the network to identify its most similar communities based on semantics (Emmons, 2016).

CLIP, or contrastive language-image pretraining, uses a Vision Transformer (ViT) model pre-trained on about 400 million contrastive image text pairs to encode the images. Essentially, the model references learned visual concepts from the natural language pre-training which supports zero-shot transfer for learning on new data (Radford et al, 2021). The model used in this work comes from HuggingFace's OpenAI and uses these image-text pairs for feature embedding and image classification tasks further down the pipeline. BLIP-2, or Bootstrapping Language-Image Pre-training, is typically implemented for unified vision-language understanding and generation. Here, BLIP-2 is used to compare embeddings which are in turn used to generate short descriptions of the image.It uses a unimodal vision encoder that divides the image into patches and encodes them as a sequence of embeddings (Li, Li, SAvarese, Hoi, 2023). This encoder is frozen and then uses a Querying Transformer (Q-Former) as another trainable module for the frozen encoder. The Q-former is a small transformer model that uses learnable query vectors on the frozen image encode (Li, Li, SAvarese, Hoi, 2023). Unlike CLIP, this model's vision encoder does not use image-text pairs, and is expected to have embeddings that represent strong visual features that show different outputs.

DATA

The 12,821 images were collected using a customized content scraper script developed using Python libraries to collect images and meta data off the Instagram social media platform based on searching for specific hashtags and account names known in the anti-femicide social movement online community (Chenou, Cepeda-Masmela, 2019; Bedrosian 2022; Rohm-Diaz, Souza Valuano, Ferreira Xavier, 2023). Some hashtags include: *#mexicofeminicida, #méxicofeminicida, #niunamenos, #niunamashmo, #vivasnosqueremos, #noestamostodas, #feminicidiosenmexico, #elmachismomata, #yotecreo, #8M, #nonoscallamosmas, #violenciadegenero, #violenciamachista, #femicidioemergencianacional, #25N, #UnDíaSinNosotras.* Some accounts include: *@apartados8km, @noestamostodas, @brujamixteca, @feminicidiocdmx_, @demachosahombres, @abogadafemina, @redpsicofem.jrz, @colectivoyositecreo.* Metadata collected from the hashtags and accounts include comments, likes, hashtags, URLs, account information, and automated descriptions from Instagram's API.

RESULTS AND DISCUSSION

A quick review of the labels and captions shows how most of the images represent some type of protest or informational content using text, particularly in Spanish. After these two classes, more nuanced labels like 'an image of solidarity' or 'a photo of a sign(s) or banner' are harder to identify. Similarly, these more nuanced labels can potentially be represented by 'an image with text in Spanish' and 'a photo of a protest' in a more general form. Looking to how these classes interact with each other based on their caption embeddings can help answer this question of how the visual semantics shows nuance from the model outputs.

The Leiden algorithm was used to partition the data into refined groups to identify a quality partition. This is a community-detection method that partitions the nodes of a network into densely connected groups by optimizing (Miasnikof, 2019). These groups are optimized using functions which are the evaluation metrics, Modularity, Coverage, and Conductance. Here, modularity, which scores how tightly edges fall within compared to between groups can tell us the intra-category connectedness verses a leakage across label classes (Zhu et al., 2025). There is a somewhat high modularity score at 0.78 which shows that the communities, or subgraphs are decently tight, consisting of a good intra-category cluster. In this case, the nodes in the clusters are semantically similar enough to each other. Coverage looks at the fraction of total edges that fall within detected communities.

Evaluation Metric	Value
Modularity	0.78
Coverage	0.99
Performance	0.99
Average Conductance	0.0002

Table 1. Community Detection Evaluation Metrics

Table 1, shows a 0.99 coverage value representing extremely good internal density for each cluster. It represents a fraction of all the graph edges that fall within the clusters (Delling, 2007). Although, this coverage metric seems a bit high which could be attributed to noise influence. Then, the conductance metric measures the sparsity of the separation between a cluster and the rest of the graph (Miasnikof, 2019). If this metric is low, clusters are well isolated, meaning communities don't connect to other communities relative to their size. Essentially, the low conductance metric found here (0.0002) shows that images are highly connected within each community, and do not share outside images, which indicates that each group is semantically cohesive (Emmons, 2016). The metrics show that the Leiden algorithm identifies communities with visually semantic similarity as each of the communities are highly inter-connected and partitioned far enough from one another to implement nuance.

This research looks specifically at how social movement images are structured into a narrative based on their visual semantic relationships. A combination of machine learning transformer models using feature embedding, and zero-shot captioning to create a network of images collected from Instagram is implemented to be analyzed using semantic network analysis. This network is represented by labeled images as nodes and their descriptions are the edges semantically connecting them based on similarity scores. The Leiden community detection model is used to understand the latent visual semantics supporting social movement images. The results show that specific label classes like 'an image with text in Spanish' and 'a photo of a protest' garnered most of the class labels, covering up more nuanced labels like "solidarity" or "a photo of a sign". Future work will look deeper into parameter tuning or different community detection models to highlight narrative importance for these latent themes.

GENERATIVE AI USE

I employed BLIP-2 for the following purpose(s): Image Captioning comparisons to other vision transformers. I evaluated the output by using cosine similarity of the captions and image embeddings. The authors assume all responsibility for the content of this submission.

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Empowering Ethnic Minority Cultures: The Role of Short Video Algorithms in Cultural Sustainability

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ABSTRACT
As algorithm-driven content curation becomes an increasingly common feature of short video platforms, it becomes critical to reveal the role of short video algorithms in cultural sustainability for Ethnic Minorities (EMs). This study conducted one-on-one semi-structured interviews with 15 young Tibetan users, and employ the thematic analysis for exploring the findings. Furthermore, the research results indicate the importance of leveraging short video platforms to enhance the visibility and sustainability of ethnic minority cultures, thereby providing a foundation for developing future algorithmic systems that support global cultural communication.

KEYWORDS
Ethnic minority users, Tibetan users, algorithmic systems, short video platforms, cultural sustainability

INTRODUCTION
Algorithms determine the type of video content that users are exposed to, and watching this content constitutes a large part of the platform experience (Bhandari & Bimo, 2022). Short videos spread quickly and circulate information efficiently, helping to promote content sharing on different topics. TikTok is a short-video platform with rich content and diverse themes, which can meet the needs of different users. The platform is characterized by its algorithmically curated "for you" page, and users have expressed a high level of satisfaction with the content provided by the algorithm. Approximately 40% of users reported that this content was extremely or very interesting (Pew Research Center, 2024). At the same time, short videos are highly interactive and can interact with users from different regions, ethnicities and countries. These short video platforms play an important role in shaping the way ethnic minority identities are constructed and perceived (Hao, 2024; Lin et al., 2023). Ethnic minorities (EMs) are more likely to watch and share content related to their cultural background. EM Vloggers enhance the sustainability of their own cultural development by teaching ethnic languages and building identities for their vlogging audiences (Chen et al., 2023). Therefore, for EMs, algorithms of social media platforms based on short videos need to consider the cultural connotations and characteristics of different ethnic groups, adapt to different ethnic languages and respect the living habits of EMs. A comprehensive understanding of these platforms' role in this process is instrumental in evaluating their contribution to cultural diversity. Thus, this study seeks to answer the following research question: How do algorithmic systems of short video platforms support the EMs' cultural sustainability?

RELATED WORK
The cultural sustainability of EM is seen as a vital and inseparable aspect of cultural diversity in multicultural states (Xu, 2007). Inter-ethnic interaction are both opportunities and challenges for minority cultures. Some interactions may lead to cultural exchange and adaptation, but due to differences in size, prestige, and power between ethnic groups, it is challenging for EMs to maintain the cultural sustainability (Bunce & McElreath, 2018). Besides, many ethnic vloggers have started to use videos to showcase and promote their ethnic culture online (Chen et al., 2023). Douyin's algorithm positively influences the visibility of ethnic content, encouraging the creation of hybrid content that combines traditional ethnic elements with contemporary trends. There has been a systematic increase in the visibility of ethnic content that blends minority cultures with global trends (Hao, 2024). Therefore, the algorithmic practices of EMs need to be paid attention to and explored, especially in terms of their commonly used social media platform, to explore how they participate in specific algorithmic practices. Meanwhile, based on this, this study further explores how the algorithmic mechanism of short video platforms can effectively enhance the visibility and sustainability of ethnic minority cultural content.

METHODOLOGY
This study takes EMs in Tibet as the main sample. The survey shows that China's popular short-video platform, Douyin, has attracted the attention of the younger generation. Surveys show that users aged 18 to 34 are more likely to use TikTok than older users in the U.S. (Pew Research Center, 2024). In 2024, 49% of Douyin users in China were under 30 years old, with 20% of the user group under 24 years old (Statista, 2024). Therefore, this study focuses on the group of college students at the Xizang Agricultural and Animal Husbandry University, who are more experienced in the use of social media platforms. A total of 15 active Tibetan users (10 male and 5 female) of short video platforms were recruited through field research and face-to-face interviews, using convenience sampling

and snowball sampling to collect respondents on June 11-13, 2024. The researchers obtained informed consent from the users, recorded the interviews, anonymized the data, and finally transcribed them into text for further analysis.

Thematic Analysis is a data-driven approach (Guest et al., 2011) that not only describes the data in detail but also discusses various themes by interpreting the data. In studies targeting EMs, this approach is helpful in mining user perceptions and revealing the deeper reasons behind appearances (Wu et al., 2023).

RESULTS

Promoting the dissemination of ethnic minority cultures for "being seen"

In a multicultural society, it is particularly important to ensure the visibility of ethnic minority cultural content. For EMs, "being seen" is not only a matter of information dissemination, but also a key factor in cultural identity and communication. For minority cultures in particular, cultural diversity and uniqueness not only enrich the overall cultural landscape of a society, but also provide a way for these groups to express themselves and maintain cultural visibility. "*I think it is important to spread more of our Chinese culture or our own ethnic culture on the Douyin (P07).*" Algorithmic recommendation system plays a dual role in this process. On the one hand, it facilitates EMs in accessing information about their own culture. Through precise recommendations, the system helps EMs discover content related to their culture more efficiently, thereby strengthening their cultural identity. For example, P1 mentioned enjoying focusing on the differences in ethnic costumes across various cultures on short video platforms. On the other hand, it directly influences cultural transmission. By recommending content created by EMs to a broader audience, the system enables the spread of ethnic culture through short video platforms. Many EMs, driven by their strong cultural identity, are eager to share and disseminate their ethnic culture via these platforms, making them vital tools for cultural dissemination.

Balancing minority content with algorithmic recommendation preferences

While most EMs expressed their willingness to use TikTok to browse, follow and post videos related to their own culture, there are still certain challenges. Some users pointed out that the short video platform was unable to accurately recognize Tibetan fonts due to technical limitations. Therefore, by combining the use of narration in their own language with subtitles in the dominant language (e.g., Tibetan narration with Chinese subtitles), EMs are able to retain traditional cultural characteristics while facilitating comprehension by a wider audience, thus attracting more viewers. This bilingual or multilingual approach to content production provides a window for people of different backgrounds to understand and appreciate minority cultures. Moreover, the EMs often need to adjust their content to increase exposure and engagement in order to adapt to algorithmic preferences, which poses a risk of cultural homogenization. EMs must find a delicate balance between embracing global influences and maintaining the uniqueness of their cultural content. As Hao (2024) notes this balance is crucial to ensure that the third space becomes a true site of cultural negotiation rather than merely a site of global cultural assimilation.

Addressing location-based recommendation and interpersonal networks

Geographic location and social networks are key factors that influence the recommendation algorithms of short video platforms. By integrating this information, the algorithm can more accurately recommend relevant content with local characteristics to users, thus enhancing their sense of belonging and identity. Recommended content based on the user's location is closer to daily life, such as nearby activities, local news, etc., which not only enhances the user's participation and interaction but also promotes communication within the local community. For example, *"After I opened the location, those (contents) related to our school were shown (P06)."* In addition, interpersonal networks, like following friends or creators, help users discover and share content through social connections. Users tend to pay attention to and interact with the content shared by their classmates or friends around them, fostering a sense of community and encouraging more time spent on the platform. Through functions such as "people nearby", users can easily discover interesting things around them, further strengthening the dissemination of content based on geography and social relationships. "*One of the main concerns is what I like and what I'm interested in. The other one that I often watch are those videos posted by my classmates around me (P02)."*

CONCLUSION

The combined role of algorithms and human beings plays an important role in the success of content, where it is crucial to gain user engagement, imagine the needs of the algorithmic audience, and keenly observe the audience response to facilitate the dissemination of content in a broader sense (Glotfelter, 2019). Utilizing the important role of algorithms in the dissemination and promotion of distinctive minority cultures, especially in the context of short-form video platforms, the value of minority cultures can be effectively explored and presented. Besides, platforms should implement effective regulatory systems and transparent review standards, support the creation of multilingual content, encourage the dissemination of high-quality content, and reduce the impact of low-quality or negative content. Through these measures, the coexistence of cultural diversity and uniqueness can be achieved in the context of globalization, and a more inclusive and pluralistic cultural ecosystem can be built.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Shu Fan: conceptualization, methodology, writing – original draft, funding acquisition; Zhang shutian: data curation, formal analysis; Jing Liu: writing – review and editing; Jinglong Chen: supervision, writing – review and editing

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Grit in the Information Machine: Library Professionalism in a World Without Friction

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ABSTRACT
The goal of eradicating friction has driven the development of information spaces. Yet, the problems associated with a loss of friction have led many to suggest ways to reintroduce friction. Unfortunately, libraries are often overlooked in these discussions. This poster outlines an initial framework for the role of librarianship in introducing necessary friction in ways that improve the quality of society's navigation of information spaces.

KEYWORDS
Efficiency, user experience, library workers, frictionless sharing

A WORLD WITHOUT FRICTION
Economic, social, and political systems have long prioritized the eradication of friction—e.g., the lubrication of processes in ways that maximize efficiency and minimize waste. Adam Smith (1776/2022) used the example of a pin factory to illustrate how factors such as the division of labor and specialization could reduce friction and dramatically increase output. Frederick Taylor (1912) popularized a management-led approach to the eradication of friction that promised to systematically improve productivity. Buckminster Fuller (1969) declared the future of technological advancement to be one of *ephemeralization*—"doing ever more with ever less" (p. 287). These obsessions quickly moved beyond the boundaries of work, becoming "a template for almost all human activities" (Harrari, 2014, p. 390). Information spaces, in particular, have long been captivated by the idea of eradicating friction. Claude Shannon (1949) aimed to reduce friction, which he termed *noise*, to produce the maximum rate of information transmission. The mantra of digital design, articulated by Steve Krug (2000), is the reduction of friction that makes users think too much. In 2011, Facebook introduced Open Graph, which would enable "frictionless sharing" as apps would be able to automatically post a user's activities to the platform without constantly asking for user permission (Boutin, 2011). Noting the friction involved in pulling out one's phone to search for information, scientists at MIT developed AlterEgo—a chip that uses neuromuscular signals in the jaw and face to detect what a person is thinking (Hardesty, 2018). In 2024, Elon Musk's company, Neuralink, successfully implanted a computer chip into a person's brain to allow them to do things like browse the web, play games, and operate their phone using only their thoughts (Chappell, 2024). While the technology currently focuses on helping people with neurological injuries, the longer-term goal of transhumanists like Musk is the merging of people with AI in ways that *jump-start* the next stage of human evolution (Gallego, 2016). This next stage promises to be without friction.

Yet, the prioritization of friction reduction has come under increasing scrutiny. Rochlin (1998) argued that the eradication of friction tends to dampen the only forces that constrain an organization's worst impulses and enable it to detect error. Sutton and Rao (2024) suggested that the eradication of friction is responsible for the proliferation of bad ideas and the muzzling of creativity. The same lubricity that enables frictionless communication also enables the mass spread of mis/disinformation, hate speech, malware, and cyberbullying (Jahn et al., 2023). The removal of friction has been cited as a contributing cause for crises like *Black Monday*, the 9/11 attacks, Boeing 737 crashes, the Great Recession, and the COVID-19 pandemic (Vardi, 2021; Friedman, 2020; Bernhardt & Eckblad, 2013). As a result, calls are increasing for the reintroduction of friction (Schwartz, 2012). These calls are based on findings showing that people are generally good at spotting things like misinformation when they devote time and energy to it (Bago, Rand, & Pennycook, 2020). Proposals to introduce friction as a means of increasing user deliberation include unskippable videos about misinformation (Fendt et al., 2024), time delays to reduce virality (Simpson & Connor, 2020), quizzes that force users to think about information before commenting or sharing (Fazio, 2020), and visual clues for questionable information (Bhuiyan et al., 2018). These proposals are limited, however, because they mostly depend on a platform's voluntary efforts to combat low-quality information. And, while there are promising approaches the government could use to introduce friction through content-neutral time, place, and manner restrictions (Frischmann & Benesch, 2023), these efforts are still likely to be met with First Amendment challenges. These efforts also sidestep the role of librarianship—the profession best situated to confront these issues.

LIBRARIES AND FRICTION REDUCTION
Yet, librarianship faces its own challenges in asserting its role, particularly to the extent that it has adopted for itself the goal of friction eradication. Since at least the 1980s, a narrative of public service organizations as wasteful swept across several countries. Driven by neoliberal efforts to systemically reduce government spending and size, New Public Management advised the public sector to act more like private businesses (Lorenz, 2012; Lapuente & de Walle, 2020). Managerialism supported this aim through a focus on rational objectives, performance standards, generalizable practices, economies of scale, competition, efficiency optimization, and incentivization (Siltala, 2013;

Lapuente & de Walle, 2020). As a result, students in public schools become raw materials for educational factories (Au, 2011), library patrons become customers (Kann-Christensen & Balling, 2011), and more functions were transferred to paraprofessional library staff in the name of increased efficiency (Litwin, 2010). When DOGE gutted the Institute of Museum and Library Services, the agency's new acting director stated, "I am committed to steering this organization in lockstep with this Administration to enhance efficiency and foster innovation" (Italie, 2025). Though it can be reasonably argued that the actions of DOGE are less about efficiency than they are about ideology, it seems likely that the profession will continue facing pressure to adopt friction-reduction efforts.

THE "GRIT" FRAMEWORK

The Grit Framework outlines ways for the profession to introduce and maintain *useful friction* within information spaces through a prioritization of professionalism. As noted by Cox (2023), the *logic of profession*—which includes the expertise of workers as they autonomously apply what they know—is inherently less efficient and often at odds with the *logic of organization*—which is built around a prioritization of efficiency. Useful friction falls into one of several categories, based on the distinctions between professions and occupations (Roberts & Donahue, 2000).

First, professions assume mastery of specialized theory (Roberts & Donahue, 2000). A librarian's knowledge of information practice theories enables them to introduce friction at key points during a person's encounter with information. For instance, while the frictionless nature of AI-enabled search is sufficient for fact-finding, it is detrimental for more complex searches. Librarians have the knowledge necessary to guide people through messy and inefficient search processes that are more likely to meet their needs and objectives, e.g., exploration, serendipity, and consideration of context (Shah & Bender, 2022). Similarly, they are trained in information literacy, which introduces friction through a consideration of sources, critical evaluation, and a consideration of information's relevance (Taylor & Jaeger, 2022). While some have suggested that information literacy has done as much as it can to introduce friction, necessitating more technocratic solutions (Lewandowsky et al., 2017), this conclusion seems premature if for no other reason than the lack of resources and funding that have historically been allocated to literacy efforts. Librarians also have the knowledge necessary to design and implement successful programs, e.g., book clubs, pop-ups that spotlight local issues, cooking workshops, and crafting (Curtis, 2025; Dennen, 2025; DeRosier, 2023; McIvor, 2024). The goal of these programs—as well as those who attend them—is not a frictionless information experience, but rather one that is messy, creative, self-reflective, fun, and inspiring.

Second, professions introduce friction through the introduction of worker autonomy (Roberts & Donahue, 2000). Without autonomy, library workers cannot apply their specialized knowledge. Instead, their autonomy is overrun by standardized practices—often sourced from outside the organization. While these practices are efficient, particularly as workers follow preplanned processes, the lack of context can worsen information outcomes. For instance, Trujillo (2014) noted the danger of a school's reliance on decontextualized approaches from intermediaries—which replace pedagogically sound teaching, worsen student outcomes, and harm a teacher's professional identity.

Third, professions introduce friction through a prioritization of the needs of others over *utilitarian gain* (Roberts & Donahue, 2000). While the reduction of friction in information spaces *can* advance societal interests, it is used more often in the name of consumerism and profit. Facebook (n.d.), for instance, defines friction as any delay that represents an opportunity for customers to abandon their retail journey. Librarianship, on the other hand, is motivated by a desire to meet the needs of people. They contribute to social capital by building trust, connecting people to other people and resources, providing social support, reducing social isolation, and helping people build skills (Johnson, 2012)—all actions that require friction. This development of social capital can have subsequent effects on a person's information consumption. In the context of health, for instance, research has shown that social capital has positive effects on the scope of information sources a person consults, information efficacy, and information-seeking (Kim et al., 2015). The removal of friction threatens these positive effects because it removes the relationships through which social capital develops: "When you eliminate all friction, you risk removing the relationship and being left with blind trust in strangers (Frischmann & Benesch, 2023).

Fourth, professions introduce friction through self-monitoring according to ethical standards (Roberts & Donahue, 2000). Many of the ethical considerations that drive librarianship (ALA, 2024) can run counter to the profit considerations currently driving frictionless information spaces. For instance, a consideration of information privacy—and a recognition that privacy is lost in frictionless information spaces (Floridi, 2005)—limits a company's ability to target people with ads based on their library reading habits. Values around equitable service may cause a library to spend money on large text materials for a small portion of its community. Thus, while increasing friction, library ethics increases the quality of a person's navigation of information spaces.

CONCLUSION

If librarianship prioritizes the logic of organization, they will not only contribute to the problems associated with frictionless information spaces, but they also risk obsolescence given the superior friction-reduction capabilities of for-profit companies. Fortunately for society, librarianship is driven by a different set of interests. By prioritizing

professionalism, library workers can reintroduce friction that improves the quality of society's navigation through information spaces.

GENERATIVE AI USE

No generative AI was used.

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AI and Social Justice in LIS

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ABSTRACT
The rapid evolution of artificial intelligence (AI) continues to reshape how information is produced, shared, and accessed, raising urgent questions about equity, accountability, and fairness. This poster, inspired by the upcoming volume *Assessing AI and Social Justice Intersections: Challenges and Opportunities,* explores the intersection of AI and social justice, highlighting select forthcoming chapter content from real-world experiences and challenges, community-driven solutions, and varied theoretical and computational frameworks. It draws on diverse philosophical, methodological, ontological, and practice-based perspectives to critically evaluate AI's potential both as a mechanism for empowerment and force capable of exacerbating existing inequalities. The poster provides multidisciplinary and international coverage of ethical frameworks, resistance strategies, educational applications, data autonomy, cultural competence, and equity in information systems design. Algorithmic oppressions in information retrieval, equitable implementation of AI in libraries and educational institutions, culturally responsive AI practices, and community-driven AI initiatives are included.

KEYWORDS
Artificial Intelligence (AI); Social Justice; AI Ethics; AI Governance; Human-Centered AI.

INTRODUCTION
Artificial intelligence, and particularly generative AI (GenAI), has been widely praised for its positive impacts - and condemned - for its disruptive potential. This poster addresses both aspects in representing AI and the consequences of its use as a double-edged sword, be it at the global, national, regional, or local (and intersecting) levels. It spotlights exemplary scholarship at the intersection of AI and social justice/social equity in library and information studies (LIS), highlighting real-world experiences and practice-oriented challenges, community-driven solutions, and theoretical and computational frameworks of critical LIS applications and use. The collection represents selective work by researchers and practitioners in a forthcoming volume *Assessing Artificial Intelligence and Social Justice Intersections: Challenges and Opportunities* for Advances in Librarianship book series edited by Author 1 – Author 4, and to be published by Emerald Group (Bingley, United Kingdom).

AI is far from a panacea for the complex socio-technical challenges of our time. This poster highlights the concern that despite its impressive capabilities, AI solutions must be employed with awareness of their potential biases, limitations, and unintended consequences. For instance, public opinion on social media can catalyze large-scale societal change, but AI-based sentiment analysis tools may magnify certain voices while silencing others, reinforcing systemic inequities. Consequently, we need to approach the use of AI in social problem-solving with both optimism and caution. Nonetheless, the transformative power of AI in addressing social issues and advancing social justice is undeniable. Recent work demonstrates that by integrating AI into informatics research, particularly through in-context and zero-shot learning, public sentiment can be captured across different demographics, geographies, and even professional domains (Ghosh et al., 2025; Ghosh & Thajudeen, 2023). In acknowledging AI's limitations while harnessing its strengths, researchers and practitioners can illuminate inequitable trends, galvanize policy discussions, and develop ethically sound interventions. From healthcare and government services to crisis communication and archival work, machine learning systems can streamline processes and expose hidden patterns only if designed and deployed responsibly (Attar et al., 2025; Costa & Ghosh, 2025; Tai & Ghosh, 2024; Bayeck et al., 2022). By taking a data-driven, mixed-methods, interdisciplinary approach (Ghosh & Shah, 2024; Ghosh et al., 2023), AI decisions can be explained for the end users. In essence, while AI is no cure-all, it can help transform societal structures, advance equity, and sustain the delicate balance of human and machine collaboration in crisis and beyond.

However, AI applications in critical domains raise concerns that have far-reaching and transformative impacts that are often complex, intersectional, and problematic in terms of their social, cultural, political, economic, legal, ethical, and regulatory implications. Despite its quick integration throughout the technology stack, the responses to AI remain ad hoc, scattered, fragmented, isolated, and chaotic, whether by governments, corporations, international forums, technocrats, cultural memory organizations (e.g., archives, libraries, museums), educational institutions, research centers, localized communities, or individuals (Mehra, 2022). Particularly, it is important to understand the impacts of AI development and deployment in LIS-facing contexts from a social justice perspective. A social justice and social equity perspective in the field of information (including its diverse representations in LIS) promotes activism and advocacy via the use of information and communication technologies to support fairness, justice,

equity/equality, change agency, and community development with, and on behalf of, all people, especially those considered on society's margins (Mehra, 2023). If LIS is to advance a commitment to social justice, that commitment must extend to emerging technologies, including AI.

ORGANIZATION

The poster highlights the following select works in four sections connecting them together (visually and in narrative form) within the broad umbrella of "AI + SJ".

1. Social Justice in Application to Artificial Intelligence in a Neoliberal Reality: Decolonizing Actions to Dampen Dysfunctional Commodification - The poster opens with a brief narrative around intersecting meanings of social justice in application to contemporary AI design and development entrenched within a neoliberal reality that is a cultural hallmark around the globe in the quarter mark of the 21st century. Readers will take away decolonizing strategies of proposed actions that might dampen a dysfunctional and hegemonic commodification of both AI and social justice that continues to perpetuate an imbalanced colonial and imperialist world order. Actions of resistance are explored to provide alternate (and complementary) approaches that are unbiased, just, fair, and equitable. The goal is to disrupt the unchecked and hegemonic growth of AI in ways that are intentional, systematic, community-engaged, participatory, and democratic. Illustrative example(s) of proposed actions: Require AI leads to articulate "social justice" in their project in terms of justice-as-desert, egalitarianism/equity, utilitarianism, distributive justice, justice-as-fairness, and/or justice-as-sustainability for traditionally marginalized communities as applicable.

2. Human-Centered AI: Putting Humans Back in AI Applications - The next section threads AI and social justice intersections through a study of intelligent conversational agents and neural networks. It bridges subdisciplines of Human-Computer Interactions (HCI), Information Retrieval (IR), and Artificial Intelligence (AI), via exploring applications that solve complex sociotechnical problems in information systems design and development. The narrative draws on synergies across human-centered AI aligning with the current shift in AI research towards more user-focused, ethical, and responsible systems. The work highlights ethical application of AI and its conversational capabilities within complex sociotechnical systems, particularly in its focus to improve the lives of marginalized communities through the application of trustworthy AI. Examples of fake news, cyberbullying detection, and conversational agents are presented.

3. Priming of Quality or Human/AI Favoritism? A Health Information Equity Perspective - This section focuses on the dynamics of peer knowledge production, algorithmic fairness, and AI-assisted public health communications illustrating through the domain of health informatics. The research highlights how AI systems—when applied in health, education, and organizational settings—can both reinforce and mitigate social inequities. The narrative addresses recent vaccine hesitancy in online communities and the deployment of facial recognition technologies in universities, using frameworks such as organizational justice and human-centered design to provide a critical and social justice-oriented point of view of AI applications.

4. Sometimes Governance Just Ain't Enough - This section explores AI and social justice in digital archives, bringing connections to topics of digital access and preservation, data and information governance, and knowledge management and organization. The narrative also provides grounding in archives and law to the study of emerging technologies to examine their ongoing trustworthiness and their impact on the rights of disadvantaged people and underserved communities. It illustrates the AI and social justice issues through research with Northern Cheyenne Tribes and the Chief Dull Knife College Woodenlegs Library in their work designing preservation solutions that would preserve Cheyenne heritage in the face of natural disasters such as wildfire in a low-resource environment.

CONCLUSION

This poster summarizes the following outcomes for viewers:

- Recognize core social justice implications of AI within LIS contexts.
- Mitigate algorithmic bias and support culturally responsive AI solutions.
- Explore policy, research, and hands-on collaborative practices that promote inclusive, transparent AI initiatives.
- Synthesize actionable guidelines for ethical AI development in the social justice context within the domains of health informatics and digital archives.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Authors are listed based on alphabetical ordering of the last name. All authors were involved in conceptualization, methodology, data curation, formal analysis, writing, reviewing, editing, and project administration.

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AI Readiness in Libraries: A Technology–organization–environment framework for Action

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ABSTRACT
Many libraries have AI pilots, such as Chatbots and automated metadata pipelines, but librarians often feel unsure about integrating these tools into everyday service. This study presents preliminary results from an investigation into defining what "AI readiness" means for libraries. A systematic review and qualitative analysis of 46 publications, combined with five pilot interviews, yielded 145 open codes that were synthesized into a three-layer, fourteen-pillar framework. The technological layer emphasizes computing access, usable data, and a secure sandbox; the organizational layer encompasses explicit AI goals, leadership support, staff AI literacy, and clear guidelines; the environmental layer comprises privacy regulations, peer pressure, user feedback, public policy, and professional organization backing. Interviews revealed gaps in data quality, bias checks, and user feedback routines, while leadership engagement and a culture of small-scale experiments appear as key factors. Our next phase will include interviewing at least twenty additional librarians, developing survey instruments based on the framework, and testing interactions among pillars. The framework aims to serve as a practical checklist for library managers to evaluate AI readiness and identify areas needing development before committing resources to full AI deployment.

KEYWORDS
AI readiness; AI adoption; AI in libraries; Technology–organization–environment framework

INTRODUCTION
Artificial Intelligence (AI) is reshaping how libraries deliver services, manage resources, and engage with communities (Johnson et al., 2024; Wheatley & Hervieux, 2024). Applications range from chatbots and AI-assisted reference to automated metadata and instructional support tools (IFLA, 2023). While many libraries have shown interest or piloted such tools, few feel technically or organizationally ready to expand or sustain them (Pence, 2022). Similar readiness gaps exist in education (Akgun & Greenhow, 2022; Crompton & Burke, 2023), healthcare (Secinaro et al., 2021), and other sectors (Alsheibani et al., 2020).

Readiness is crucial because AI deployment requires significant resources and carries risks. Poorly managed data can breach privacy laws, undertrained models may reinforce bias, and failed pilots can waste limited budgets (Mehrabi et al., 2021). Libraries need a clear understanding of which technical, organizational, and external conditions are in place before scaling AI. Existing readiness indices (Cisco, 2024; EDUCAUSE, 2025; Oxford Insights, 2023) offer broad benchmarks but lack relevance to library-specific practices.

To address this, our poster presents early findings from a thematic analysis combining literature review and librarian interviews. The goal is to develop a sector-specific Library-AI Readiness Framework to help libraries assess capacity, identify gaps, and prioritize actions before implementing or expanding AI tools.

METHOD
We used thematic analysis to identify patterns across literature and interviews. The initial literature review covered three areas: (1) technology adoption frameworks like TOE and DOI (Stenberg & Nilsson, 2020); (2) AI-readiness assessments in higher education and other sectors (EDUCAUSE, 2025); and (3) case studies on AI in libraries (Shal et al., 2024). To connect research with practice, we conducted semi-structured interviews with five U.S.-based academic librarians working in data services, systems, cataloging, and digital preservation. This pilot phase will be expanded in future work.

Two researchers independently open-coded each article and interview transcript by highlighting phrases that pointed to a condition—good or bad—for AI work in libraries. This process generated 145 initial codes, such as "Free trial ends too soon" and "Patrons want an opt-out option." Next, similar codes were merged and grouped into broader categories aligned with three layers of the TOE framework. For instance, references to missing MARC fields, noisy OCR, and limited data exports are clustered under the category "Data quality" in the Technology layer. Categories were then synthesized into themes--a theme remained in the model only if it appeared in at least two sources (literature and/or interviews). A summary of the resulting fourteen pillars was sent to all interviewees for member checking. They suggested clearer wording but no additions or removals.

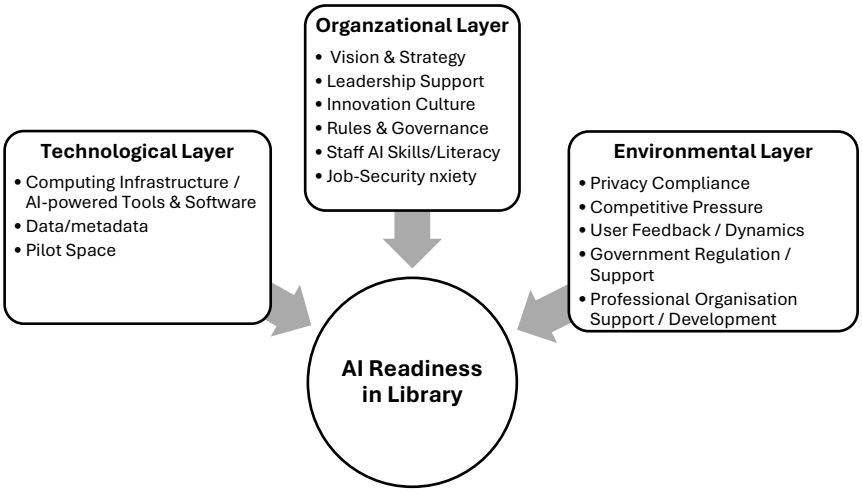

Figure 1. AI readiness framework for Libraries based on TOE

PRELIMINARY RESULT

In this poster, we report a preliminary Library-AI Readiness Framework that groups the conditions for successful AI work into three layers—Technological, Organizational, and Environmental—and fourteen pillars (Figure 1). The technological layer refers to the physical and digital assets that let a library build, test, and run AI applications. Computing infrastructure and AI-powered tools mean hardware and working AI applications that staff can actually use. This might be a library PC, a campus cloud virtual machine, a ChatGPT account, an auto-subject-heading plug-in, or a transcription model. Data and metadata refer to the scale and quality of what the library can supply to AI tools, including MARC records, digital-collection files and metadata, repository items, OCR text, link-resolver logs, circulation statistics, and even chat transcripts. Pilot space refers to a sandbox or test login that mirrors the live ILS or discovery layer, but uses dummy data. Staff can run AI scripts here without risking real records, and the sandbox can be wiped or reset with a single click. Containerization (e.g., Docker) and version-controlled notebooks further shorten the reset cycle while preserving reproducibility.

The organizational layer covers strategies, people, and internal rules. Vision and strategy mean the library sets at least one AI goal in a formal plan and puts resources behind it, for example, a published document (strategic plan, annual goals, or digital roadmap) that names at least one AI objective and allocates a small budget or staff time to pursue it. Leadership support is the visible, ongoing backing from senior management; this can be regular mentions in meetings, a named AI sponsor, or decisions (funding, staffing) that remove barriers rather than create them. Innovation culture refers to everyday working norms that encourage trying new ideas, sharing prototypes, and learning from failures without blame. A healthy innovation culture can show up in regular "show-and-tell" meetings where lessons learned from failed and unfinished prototypes are discussed. Rules and governance are the internal guidelines that regulate how to propose, review, and launch an AI-related project. Staff AI skills and literacy refer to the knowledge staff need to understand and critique AI tools, such as core concepts, prompt design, and bias awareness; this can be demonstrated by completed training hours or micro-credentials. Job security anxiety is the degree of staff concern that AI might reduce work hours or change roles.

The environmental layer deals with outside forces. Privacy compliance refers to alignment with national, state, and institutional privacy laws and guidelines (e.g., GDPR-like rules, FERPA, and ALA statements). Competitive pressure means the momentum created when peer libraries, commercial discovery platforms, or other vendors adopt AI features, prompting the library to keep pace. User feedback and dynamics mean listening to patrons, students, and faculty about AI prototypes and feeding those comments back into design or adoption decisions. Government regulation and support mean federal or state initiatives—such as grants, AI strategies, or copyright guidance—that encourage or shape AI adoption and that the library must follow. Professional organization support and development opportunities refer to resources, training, and standards offered by groups like ALA or IFLA that help the library build AI capacity, including webinars, toolkits, joint purchasing agreements, or micro-credential courses.

FUTURE WORK

We will expand interviews to at least 20 librarians from diverse settings, then develop a short team-based survey to assess readiness. Pilot testing will establish reliability and readiness thresholds (low/medium/high) for each pillar. Future analysis will explore how pillars interact—for example, if leadership reduces job anxiety or if user feedback speeds up governance. All tools and anonymized data will be shared in an open repository to support broader use and refinement.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Hengyi Fu: Conceptualization, Formal Analysis (lead), Investigation (lead), Methodology (lead), Writing – Original Draft Preparation, Writing – Review & Editing (lead). Fenfang Cao: Investigation, Formal Analysis, Visualization. Yuan Li: Methodology, Validation, Writing – Review & Editing (equal). Souvick Ghosh: Writing – Review & Editing (equal)

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How Privacy Notifications Shape Privacy Management Strategies among Quantified Self Users

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ABSTRACT
Privacy policies, as the most direct embodiment of the principle of informed consent, are facing a crisis of ineffectiveness. Users frequently face uncertainty about the collection, use, and potential consequences of their personal data. A Stressor–Cognitive Assessment–Coping Strategy framework was developed based on the Stress Coping Theory. We designed a login interface for a virtual Quantified Self (QS) APP and recruited 366 participants to conduct an experiment. Two-way ANOVA and SEM were used to analyze participants' behavioral responses and strategy preferences across different privacy notice types. The results reveal the positive effects of privacy notifications: explicit notifications significantly reduce users' privacy uncertainty and enhance trust and comprehension of privacy policies, this transparency simultaneously reduces awareness of privacy risks.

KEYWORDS
Privacy Notification; Privacy Management Strategies; Quantified Self; Scenario Experiment

INTRODUCTION
The growing ubiquity of mobile technologies and digital platforms has given rise to the Quantified Self (QS) APP, in which individuals systematically track personal data to facilitate self-monitoring and behavioral regulation (Etkin, 2016). QS practices typically involve wearable devices and mobile APPs that continuously record physiological, behavioral, and location data, providing users with insights into their health, fitness, productivity, and lifestyle patterns. While QS empowers individuals to take control of their personal development, it also exposes them to extensive data collection and surveillance. Personal data is important for QS APPs, and users' ability to engage in self-quantification depends on how much information they are willing—or required—to disclose (Maltseva & Lutz, 2018). However, this data-centric ecosystem raises significant privacy concerns. Users often lack clarity regarding who collects their data, how it is processed, and who ultimately accesses it. Although privacy policies aim to inform users and secure informed consent, they are often buried in lengthy, complex documents that users seldom read. Consequently, users find themselves in a state of privacy uncertainty—defined as ambiguity about how personal data are collected, used, stored, or shared. In this context, informed consent serves as a gatekeeper throughout the lifecycle of personal information (Ross et al., 2025). However, the practical effectiveness of privacy policies as mechanisms for informed consent is increasingly questioned. Unlike privacy decisions in traditional e-commerce or social media contexts, QS APPs collect highly sensitive and granular personal data. The virtual and often opaque nature of QS technologies makes it more difficult for users to assess privacy risks and choose appropriate management strategies.

This study addresses two critical questions: (1) How do different formats of privacy notifications (i.e., with or without explicit information) influence users' perceptions of privacy uncertainty and risk? (2) How do privacy uncertainty and perceived privacy risk influence users' privacy management strategies?

METHODOLOGY
Based on the Stress Coping Theory (Lazarus & Folkman, 1985), we used a scenario experiment method to collect data on the decision-making process of QS users. To enhance realism, the control group's QS APP login interface was modeled on designs commonly used by fitness APPs in the market. The experimental group's interface added clear privacy notifications and a privacy permission management feature. All measurement items were adapted from established instruments and modified to suit the context of this study, thereby ensuring content validity. The privacy uncertainty scale was adapted from Liu et al. (2022); the perceived privacy risk scale from Xu et al. (2009); and the privacy management strategies scale from Wang et al. (2017), Liang and Xue (2010), and Beaudry and Pinsonneault (2005). The experiment was conducted online starting in September 2024. To reduce potential bias, items measuring privacy preferences were placed between the control and experimental conditions. A total of 530 participants were recruited, of which 366 valid cases remained after excluding incomplete or invalid entries.

RESULTS
Table 1 shows that after privacy notifications were provided, users' privacy uncertainty and Perceived privacy risk differed significantly. This finding highlights the positive effects of privacy notifications.

	Group	Mean	Standard Deviation	t	p
privacy uncertainty	Control	5.604	0.967	9.097	<0.001
	Experimental	4.849	1.263		
Perceived Privacy Risk	Control	5.287	1.077	5.375	<0.001
	Experimental	4.817	1.280		

Table 1. Perceived privacy risk T-test

Considering different types of privacy notifications and levels of perceived privacy risk, we explored how these variations influenced users' choices of privacy management strategies. The detailed results are presented in Tables 2. The findings show that, regardless of whether clear privacy notifications are provided, significant differences ($p<0.05$) exist between high and low perceived privacy risk groups in selecting the three strategies. However, within both high and low groups, the type of privacy notification does not produce significant differences ($p>0.05$) in strategy choice.

Dependent Variable	Privacy Notice	Perceived Privacy Risk Level	Perceived Privacy Risk Level	P	Perceived Privacy Risk Level	Privacy Notice	Privacy Notice	P
Emotion-focused Strategy	No	Low	High	0.000	Low	No	Yes	0.059
		High	Low	0.000		Yes	No	0.059
	Yes	Low	High	0.000	High	No	Yes	0.917
		High	Low	0.000		Yes	No	0.917
Problem-focused Strategy	No	Low	High	0.000	Low	No	Yes	0.646
		High	Low	0.000		Yes	No	0.646
	Yes	Low	High	0.000	High	No	Yes	0.863
		High	Low	0.000		Yes	No	0.863
Avoidance Strategy	No	Low	High	0.000	Low	No	Yes	0.620
		High	Low	0.000		Yes	No	0.620
	Yes	Low	High	0.003	High	No	Yes	0.207
		High	Low	0.003		Yes	No	0.207

Table 2. Pairwise Comparisons

Multi-group analysis showed that privacy uncertainty was positively correlated with risk perception across all notice conditions. When detailed privacy notifications are provided, users' privacy uncertainty is significantly reduced, but their perceived privacy risk increases significantly. Figure 1 shows that users in the high privacy uncertainty group are most likely to adopt avoidance strategies ($\beta=0.282$, $p<0.001$), followed by emotion focused strategies ($\beta=0.262$, $p<0.001$) and problem focused strategies ($\beta=0.253$, $p<0.001$). In contrast, users in the low privacy uncertainty group (with informed consent) most strongly favor emotion focused strategies ($\beta=0.328$, $p<0.001$), then problem focused strategies ($\beta=0.268$, $p<0.001$), and least likely avoidance strategies ($\beta=0.210$, $p<0.001$).

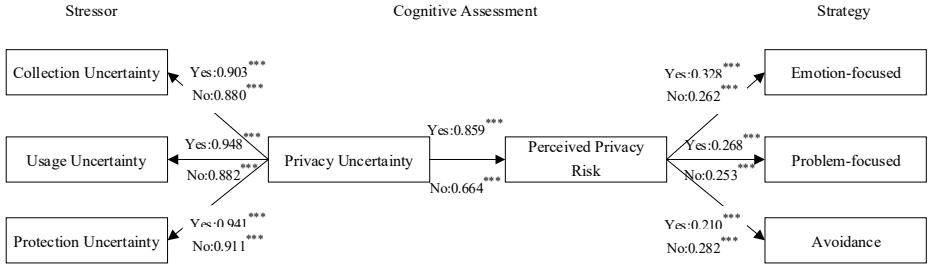

Figure 1. Multi-group analysis results

CONCLUSION

This research investigated the impact of privacy notifications on the privacy management strategies of QS users and presented the following conclusions. First, privacy notifications exhibit a positive effect. Second, privacy uncertainty is a prominent issue in QS APPs. Users often lack a clear understanding of how their personal information is collected, used, and protected. This uncertainty not only imposes a psychological burden but also significantly influences their privacy management decisions. Third, privacy uncertainty and perceived privacy risk jointly shape users' privacy management strategy choices. There is a significant positive correlation between the two, and privacy notifications further amplify this relationship. These findings suggest that while explicit privacy notifications increase transparency, they may also heighten users' sensitivity to privacy risks, thereby affecting their strategic responses.

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GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Ruili Geng: conceptualization, funding acquisition, project administration, supervision, review and editing; Sentao Li: data curation, visualization, formal analysis, software, writing – original draft; Kun Yao: methodology, formal analysis, investigation; Zhaohui Liu: writing – review and editing.

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Navigating Barriers: Disability, Healthcare Information Seeking, and AI-Enabled Chatbots

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ABSTRACT
Disabled and chronically ill populations experience significant barriers to navigating the healthcare system, including communication, attitudinal, and social barriers. Artificial intelligence (AI) may enable disabled and chronically ill individuals to mitigate these barriers. However, most literature exploring the use of AI in healthcare focuses on use by providers and institutions. A growing body of library and information science (LIS) research examines how disabled and chronically ill populations use technologies to manage their health and as tools for information access and communication support (Chen 2016; Costello & Murillo, 2014; Lundy, 2024; St. Jean, 2017). This poster reports developing doctoral student research investigating how disabled and chronically ill populations utilize AI-enabled chatbots as tools to navigate the healthcare system and manage their health. Semi-structured interviews are being conducted with a diverse sample of n=25 disabled and chronically ill participants. Guided by core principles of disability justice, we plan to conduct thematic analysis of the interview data. Our work aims to provide a critical understanding of the chatbot-facilitated information practices of disabled and chronically ill populations, and to contribute key design considerations for future technologies that support the health and well-being of these populations.

KEYWORDS
Artificial intelligence; critical disability studies; chronic illness, chatbots; information seeking

INTRODUCTION
Chronic illnesses are conditions that last a year or more, require ongoing medical attention, limit the activities of daily living, or both (Centers for Disease Control and Prevention, 2024b). Disability can generally be understood as a physical or mental impairment that substantially limits activities of daily living (Americans with Disabilities Act, 1990). Disabled and chronically ill populations in the United States (US) are growing. In 2000, approximately 19.3% of the U.S. population was living with at least one disabling condition or chronic illness (United States Census Bureau, 2003). By 2022, that percentage increased to 28.7% (Centers for Disease Control and Prevention, 2024a). Recent literature has attributed the growing populations of disabled and chronically ill individuals in the U.S. to social determinants of health (Benavidez et al., 2024).

Social determinants of health are the conditions in environments where people are born, conduct activities of daily living, and age, which impact their health and quality-of-life (Office of Disease Prevention and Health Promotion, 2025). Social determinants of health, such as low income, unemployment, and barriers to healthcare access and engagement, are drivers of disability and chronic illness in the US (Friedman, 2021; Frier et al., 2018). In patient roles, disabled and chronically ill people face significant barriers to receiving care in the United States, including attitudinal, knowledge, structural, and communication barriers from providers and healthcare systems, which negatively impact their health (Centers for Disease Control and Prevention, 2025; Lagu et al., 2022; Guidry-Grimes et al., 2020; Horner-Johnson et al., 2022; Lamba et al., 2023; Matin et al., 2021). As disabled and chronically ill populations grow and more disabled and chronically ill individuals enter the healthcare system, AI technology has been proposed as a potential way to address barriers to meaningful healthcare and wellness (Hacking, 2024).

LITERATURE REVIEW
AI has been praised by healthcare systems and providers for its potential to democratize access to healthcare and improve patient outcomes and is considered promising for managing and preventing chronic illnesses and diseases (Delpino et al., 2022; Hogg et al., 2023; Khanna et al., 2022). Emerging research indicates that AI-enabled technologies, including chatbots, may help support healthcare providers with diagnosis, patient history, monitoring, treatment support, and communication (Laranjo et al., 2016; Khanna et al., 2022; Matheny et al., 2019; Robleto et al., 2024; Yi & Kim, 2025). While the promises of AI-enabled technologies in healthcare settings are significant, they are not without risks. AI-enabled technologies face scrutiny for increased bias, privacy concerns, and reduced transparency between patients and providers (Botha et al., 2024; Chan, 2023; Luxton, 2024; Ploug & Holm, 2022; Xu and Shuttleworth, 2024). As research on the use of AI-enabled technologies in healthcare settings expands, there has been a particular focus on the development and use of AI-enabled chatbots for chronic illnesses (Griffin et al., 2021; Griffin et al., 2023; Laymouna et al., 2024; Schachner et al., 2020). Limited research exists regarding the use of chatbots by disabled and chronically ill individuals to obtain information to manage their health and navigate the healthcare system. Existing research is often deficit-based and tehnosolutionist (Lilywhite & Wolbring, 2024).

Research into the experiences of disabled and chronically ill populations within healthcare contexts has become more prevalent in library and information science over the past two decades (Antonio & Veinot, 2024; Veinot, 2009). There has been a specific focus on the information practices of individuals managing chronic illnesses and how disabled communities utilize technologies for empowerment (Brown & Veinot, 2021; Brewer, 2024; Lundy, 2024). However, this research mainly concentrates on individuals with particular chronic conditions, illnesses, or diseases, such as HIV/AIDS and fibromyalgia (Chen, 2022; Threats, 2025). There is a scarcity of LIS research that investigates the technology-facilitated information practices of disabled and chronically ill populations through a critical disability lens (Gibson, Bowen & Hanson, 2021; May, 2025). There is a need for LIS research that centers the perspectives of disabled and chronically ill populations who use AI-enabled chatbots as tools to navigate the healthcare system and manage their health, as opposed to AI being used by healthcare systems and providers to reify algorithmic and medical paternalism (Nong, 2023).

Research Questions

This doctoral student research project seeks to answer the following research questions:

1. How and why do disabled and chronically ill people use AI-enabled chatbots when navigating the healthcare system?
2. How can future technology design support the success and empowerment of disabled and chronically ill people?
    a. What are the key design considerations for technologies to support the health and well-being of disabled and chronically ill people?

METHODS

Semi-structured interviews will be conducted with (N=25) participants using a protocol that explores participants' experiences using AI-enabled chatbots when navigating the healthcare system, and their perspectives on the future of technology in healthcare. Eligibility criteria includes: being aged 18 or older, identifying as chronically ill, disabled, or both, residing in the United States or Puerto Rico, and experience using AI-enabled chatbots to find health information. Participants will be recruited across social media platforms and Listservs. Potential participants will be asked to complete a screening survey to determine their eligibility and to inform purposive sampling along intersections of identity, including but not limited to: race/ethnicity, gender, sexual orientation, and disability/chronic illness. Recruitment is not disability/illness specific to capture a variety of experiences. Purposive sampling will center the experiences of the most impacted by disability and chronic illness, consistent with a critical disability justice approach (Sins Invalid, 2019). Each interview is expected to last between 45 and 60 minutes and will be conducted virtually using Zoom. Upon completion of the interviews, participants will receive a $40 virtual gift card. All participant data will be anonymized, and pseudonyms will be used in place of actual names. Interviews will be recorded and transcribed verbatim. Interview transcripts will be provided to participants to verify the accuracy and validity of the information obtained during the interview process (McKim, 2023).

The dataset will be analyzed thematically using methods inspired by a grounded theory approach (Charmaz, 2014). The first author will employ techniques such as open coding, focused coding, and the constant comparative method throughout the analysis process. They will begin with open coding and take in vivo notes to center the voice of the participants during the data analysis process (Weiss, 1994). During the next round of coding (focused coding), they will be guided by the ten core principles of disability justice, which include intersectionality, leadership of the most impacted, anti-capitalist politics, cross-movement solidarity, recognizing wholeness, cross-disability solidarity, interdependence, collective access, and collective liberation (Invalid, 2019). These core principles will be utilized to refine the codebook throughout the data analysis process. The first author will write analytical memos as themes emerge from the data, which will be used to revise the codebook. Throughout this process, the first author will return to the transcript data periodically and continue analysis until all themes have been identified. Data analysis will be considered complete when it has reached saturation, and no new themes are identified in the data (Saunders et al., 2017).

CONCLUSION

This research aims to understand how and why disabled and chronically ill individuals use AI-enabled chatbots to access and interact with health information, thereby supporting their health and well-being while navigating the healthcare system. Guided by the pillars of disability justice, this work centers on the disability and chronic illness experience, highlighting the strengths of disabled and chronically ill individuals, rather than viewing AI-enabled technologies as a solution to illness. As such, this research challenges technosolutionist and paternalistic narratives in medicine. The findings from this study have broader implications for technology development, healthcare policy, education, and patient-provider interaction.

GENERATIVE AI USE

We confirm we did not use generative AI tools or services to author this submission.

AUTHOR ATTRIBUTION

First Author: conceptualization, project administration, methodology, investigation, writing – original draft, writing – review and editing ; Second Author: Supervision, writing – review and editing

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Academic Library and Public School Partnerships to Foster K–12 Professional Development and Learning Opportunities

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ABSTRACT
This study explores how academic libraries can strategically partner with K–12 schools to provide professional development for educators. Drawing from surveys and interviews with academic library administrators and public school superintendents in New Jersey, findings reveal strong interest in collaborations focused on information literacy, educational technology, and project-based learning. The passage of New Jersey's Information Literacy Law (S588/A4169), the first in the United States, underscores the urgency for educator training, presenting academic librarians as valuable partners. The research highlights shared goals, barriers, and recommendations for building sustainable, standards-aligned partnerships.

KEYWORDS
Academic librarians, information literacy, K–12 educators, partnerships, professional development

INTRODUCTION
Despite the presence of over 3,000 academic libraries (ALA, 2020) and 90,000 K–12 schools in the U.S. (National Center for Education Statistics, 2020), fewer than 30% of academic library strategic plans mention external partnerships including K-12 school systems, museums, and the local community (ALA, 2020; Saunders, 2015). However, advances in digital communication platforms (i.e. Zoom, Google Meet, Teams) now make academic library–P–12 collaboration more feasible and necessary. This study investigates how these partnerships can enhance professional development (PD), especially in light of NJ's new IL law (State of New Jersey, Office of the Governor, 2023) and subsequent standards requiring curriculum integration of critical information literacy skills.

LITERATURE REVIEW
The literature emphasizes the growing importance of academic library and K–12 school partnerships, particularly for enhancing information literacy (IL) and educational technology (EdTech) through PD. Collaborations between academic libraries and P–12 institutions can take various forms, including partnerships with individual schools, districts, or statewide organizations (Burhanna & Jensen, 2006; Carr & Rockman, 2003; Grimes & Marks Jr., 2024). Many previous collaborations have focused primarily on IL instruction. With over 3,000 academic libraries nationwide, including 50 in New Jersey, academic librarians can support P–12 educators via virtual or in-person PD sessions on IL, EdTech, and emerging technologies.

Research indicates that traditional one-time PD models often fall short in creating lasting instructional change. Effective PD should be content-focused, job-embedded, continuous, and collaborative (Desimone & Garet, 2015; Wei et al., 2010). Professional learning communities (PLCs) and digital platforms are increasingly used to support such models. PD plays a pivotal role in addressing IL instruction gaps in K–12 schools. Studies show many teachers lack training in IL and need support from academic librarians, who can provide co-developed lessons, assessments, and targeted instructional strategies (Julien & Barker, 2009; Montiel-Overall & Grimes, 2013).

In addition to providing PD on IL, academic librarians can also prepare K-12 teachers to use EdTech and AI tools. PD can help bridge the digital divide and ensure equitable access to instructional technology (Escueta et al., 2017) in addressing digital equity, the new mission of all libraries (Grimes & Porter, 2024). Through strategic partnerships, academic librarians can offer scalable PD aligned with state standards to foster educational innovation, digital citizenship, and equitable learning outcomes.

THEORETICAL FRAMEWORK
This study is grounded in Weick's (1995) theory of sensemaking. This theory provides a compelling lens through which to interpret how academic library administrators and public school superintendents in New Jersey navigate the formation of Professional Development and Learning (PDL) partnerships in response to evolving educational demands. Sensemaking is defined as the process by which individuals and organizations interpret ambiguous or novel circumstances to construct meaning and guide action (Weick, 1995). It is particularly relevant in dynamic or uncertain environments, conditions that characterize the educational field in the wake of this state's Information Literacy Law (S588/A4169), rapid technological change, and shifting expectations for educator preparedness. In the context of this study, sensemaking occurs as both academic and P-12 educational leaders work to understand their roles, resources, and responsibilities in supporting teacher PDL, especially around IL and EdTech. Weick (1995) emphasizes that sensemaking is retrospective, social, ongoing, and identity-based, each of which applies directly to the purpose of this study. Their decisions and perspectives are socially constructed through professional networks,

strategic planning processes, and state policy shifts, particularly how the new IL legislation in New Jersey creates a sense of urgency for cross-institutional collaboration.

RESEARCH QUESTIONS

1. How do public school superintendents and academic library administrators perceive the PD opportunities provided through school-academic library partnerships?
2. How can public school educators benefit from PD opportunities that academic librarians can provide through school-academic library partnerships?
3. How can academic libraries benefit from school-academic library partnerships?

METHODS

Using a mixed-methods design, two surveys were administered to New Jersey academic library administrators (n=28) and superintendents (n=32), followed by semi-structured interviews with select participants. Quantitative data from the surveys were analyzed descriptively, while qualitative responses from the interviews were thematically coded. Interviews provided deeper insights into perceived value, implementation strategies, and areas for collaboration**.**

SURVEY FINDINGS (QUANTIATIVE)

Academic Library Administrators: Results appeared to indicate a strong willingness to partner with K–12 schools for professional development (PD), though most reported no current partnerships. Respondents indicated a preference for a hybrid delivery model for PD over and above traditional in-person PD, with preferences for pay-per-session structures and PD instructor roles for reference and education librarians. Key topics of interest to be offered as falling within the self-perceived expertise of the academic librarians included IL, EdTech, Google for Education, and project-based learning.

Public School Superintendents: Only 7% reported current partnerships with academic libraries, but 93% expressed interest in establishing such collaborations. Implementation of the IL standards varied across districts, with some having revised curricula and others still developing materials. While 64% reported a school librarian in every school, staffing levels differed. Preferred PD topics mirrored those of academic librarians: IL (85%), EdTech (85%), project-based learning (77%), and evidence-based writing (69%). Districts supported PD certification in IL (88%) and EdTech (75%) and preferred flexible hybrid delivery formats. Fee preferences also leaned toward pay-per-session models.

INTERVIEW FINDINGS (QUALITATIVE)

Academic Library Administrators' Perspectives (n=3): New Jersey academic library administrators revealed varied experiences and readiness for partnerships with K–12 schools. While Participants 1 and 2 had no formal partnerships, both expressed interest in future collaborations. Participant 3 had an active partnership with Newark Academy, offering a research-intensive summer program. All administrators recognized the potential value of professional development (PD), particularly in IL, though only Participant 3 was directly involved in statewide IL curriculum development. Participants emphasized the need for academic librarians to support PD through interdisciplinary teaching, EdTech integration, and grant writing. Challenges included staff limitations, communication barriers, and unclear financial models. Participant 3's experience stood out for its strategic alignment with university programs and proactive engagement with K–12 partners, suggesting a model that others could follow.

Public School Superintendents' Perspectives (n=4): NJ public school superintendents supported academic library partnerships, though none currently had one in place. All recognized the potential value in PD offerings, especially in IL, research, and technology integration. Superintendents valued academic librarians' expertise in critical thinking and primary source literacy and supported such partnerships in their school district's strategic plans. While acknowledging varying levels of preparedness for NJ's new IL law (State of New Jersey, Office of the Governor, 2023) and IL standards, they emphasized the importance of stable, committed partnerships aligned with district goals. Preferred PD delivery included both in-person and virtual formats, with a flexible, à la carte financial structure.

CONCLUSION

The significance of this study lies in its demonstration of how academic libraries can serve as powerful yet underutilized partners in advancing professional development for K–12 educators. With the implementation of New Jersey's Information Literacy Standards, there is a pressing need for scalable, high-quality training that equips teachers to integrate information literacy, educational technology, and project-based learning into curricula. This research highlights that while partnerships between academic libraries and schools remain rare, there is strong interest and clear alignment of goals on both sides. By leveraging academic librarians' expertise and adopting flexible, hybrid delivery models, these collaborations can address critical instructional gaps, promote digital equity, and ensure that educators are prepared for evolving teaching standards. Ultimately, the study underscores the

transformative potential of academic library–school partnerships to foster innovation, equity, and lifelong learning across educational systems.

GENERATIVE AI USE

The author used Grammarly to assist with editing for grammar, clarity, and tone.

AUTHOR ATTRIBUTION

Neil D. Grimes: conceptualization, methodology, data curation, formal analysis, writing – original draft, review and editing; Samuel Fancera: data curation, formal analysis, visualization, writing – original draft, review and editing.

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Intermittent and Emergent Social Support for ICT Use in a Remote Rural Community

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ABSTRACT
Digital inclusion depends on social facilitation, formal and informal help using ICTs. This case study explores how a remote rural community in the Colombian Amazon navigates intermittent support from **digitally skilled professionals from** state agencies, NGOs, or private entities. In a context of unreliable infrastructure, residents develop four practices to sustain ICT engagement: repeated training, note-taking, tinkering, and bridging social capital. Additionally, between external interventions the community enacts emergent forms of social support for ICT learning and use. This work expands the concept of social facilitation and informatics moments beyond formal institutions and highlights how remote, marginalized communities adapt ICTs on their own terms.

KEYWORDS
Social facilitation; digital inclusion; informatics moments; rural ICT use; community support

INTRODUCTION
Formal and informal support for using digital technologies is essential for meaningful use of ICTs (Clement & Shade, 2000; Gupta, Dasgupta & Gupta, 2008). Conventional models of digital inclusion often assume stable infrastructure and fixed support institutions like libraries, schools or cybercafés. The "informatics moment" concept (Williams, 2012) denotes the process whereby people in their everyday lives bridge some digital divide they face, making use of public access computing. However, overreliance on fixed institutions can overlook the needs of remote communities, as well as marginalized and mobile populations (Asmar et. al, 2022). This study explores informatics moments in a disadvantaged, remote community to identify the strategies they develop to gain and sustain ICT access and meaningful use in the absence of stable infrastructure and institutional support.

METHODS
This case study draws on eight months of 2023 fieldwork in a rural Amazonian municipality. As a technical advisor to a campesino organization, I conducted participant observation and 11 in-depth interviews focused on digital practices. Fieldnotes captured help-seeking episodes, and interviews traced participants' digital journeys and literacy-building efforts. Data were analyzed thematically through inductive coding and close readings (Glaser & Strauss, 1967).

CONTEXT
Calamar, on the Colombian Amazon's edge, has ~10,500 residents, many in dispersed rural settlements. More than half of the population are campesinos that live in dispersed rural settlements in zones that overlap with environmentally strategic areas. They mainly practice small-scale livestock farming and agroforestry. Historical marginalization, land informality and armed conflict have restricted infrastructure and digital access. Yet, recent development and conservation efforts by state and NGO actors have introduced sporadic ICT engagement opportunities, often aligned with external goals. These remain irregular, short-term, and unreliable.

FINDINGS
Campesinos show growing interest in ICTs, yet lack consistent access to training, support, devices or infrastructure. Instead, they encounter intermittent incursions—short visits from outsiders offering basic digital support and access. These incursions are often poorly coordinated, externally driven, and disrupted by connectivity or power issues. For example, reconstructing a timeline of engagement of campesino organization with computers from observation and interviews shows that they once received a 1-day informatics training during a visit of one NGO in 2022. Eight months later, they received laptops from another NGO. A year later, a different NGO offered four 3-hour sessions of basic informatics training. Additionally, these trainings were frequently disrupted by issues with electricity, connectivity, or malfunctioning devices—highlighting how formal support mirrors the unreliability of physical infrastructure in the region. Still, community members have developed adaptive strategies. Table 1 summarizes four practices developed by campesinos engaging with intermittent and partial opportunities for ICT access:

Practice	Observed Behavior	Interview Insight
Repeated training	Learners reinforce skills by attending similar sessions repeatedly.	"I have several basic informatics courses of 40 hours, and I always saw almost the same thing, but what I did was to reinforce and I learned one or another new thing" — Diana, 43

Practice	Observed Behavior	Interview Insight
Note-taking	Participants write down instructions during sessions, despite literacy barriers.	"It was easy for me because I was good at writing, I wrote down all the techniques that the professor taught us, and the menus that the systems have, and later I would read them and look them up in the computer" — Aurelio, 50
Tinkering	People explore devices independently and share discoveries.	"They taught us the basics and we practiced those basics. But then, as we scrutinized them and looked at them, we started to find all the functions that they have, and those are skills that we developed" — Miguel, 42
Building bridging social capital	Community members seek help from digitally skilled contacts via WhatsApp.	"Excel is complex for me, I have almost never received training, so what I have in Excel has been through the entities that have helped us make tables. They pass it to my computer with a memory, but I do not create files as such in Excel" — Elena, 57

Table 1. Practices of sustaining ICT use under intermittent support

Emergent support

Beyond external interventions, informal local support networks emerge organically. Digitally active individuals—often community leaders—serve as intermediaries, sharing knowledge acquired through repeated exposure and assisting others with digital tasks. As one man explained, "All those technologies help us help" (Miguel, 42 years old). I observed digitally skilled community members being called upon in various settings—on the road, over the phone, and in their homes—to provide support with digital technologies. These individuals often maintained connections with digitally proficient professionals from external organizations, whom they could also contact for help. In this way, social ICT support has become an increasingly integral part of community leaders' responsibilities. Yet, this added labor can be burdensome, as they are already involved in a wide range of activities.

Informatics moments involving community leaders illustrate how ICT assistance circulates through everyday interactions, favors, and reciprocal exchanges. These moments unfold wherever connectivity or devices are present—on farms, in clinics, shops, roadside areas, bars, or public transportation. They often involve peer learning, collaborative problem-solving, and shared digital tasks. Even bystanders participate through observation and discussion, including critical conversations about the risks associated with digital technologies in conflict zones. There is a shared tolerance for partial success or failure, grounded in the understanding that no one is, or claims to be, a complete expert. Instead, in these everyday encounters, skills and knowledge acquired through sporadic training and bridging social capital become collective assets, embedded in community relationships rooted in reciprocity and solidarity.

CONCLUSION

Remote communities like campesinos in Calamar navigate ICT adoption through flexible, adaptive, collective strategies that compensate for erratic infrastructure and support. Rather than relying solely on fixed institutions, they build on local capacities—repeating training, taking notes, tinkering, and building social ties. These practices foster informal, emergent ICT support grounded in everyday life. These findings challenge conventional models of digital inclusion that rely on stable infrastructure and fixed support institutions, pointing instead to the importance of flexible, community-driven approaches attuned to marginalization, precarity and local practices of survival and care.

GENERATIVE AI USE

I employed Consensus for searching and summarizing literature. I evaluated the output by doing a close reading and skimming through the papers cited. I assume all responsibility for the content of this submission.

ACKNOWLEDGEMENTS

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Conceptual Framework of Data Governance and Data Organization in Higher Education: Application of the Structurational Model of Technology

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ABSTRACT
The relationship between data governance and data organization is cyclical and mutually reinforcing. Data governance defines the frameworks, standards, and roles that shape how data should be organized, accessed, and used. These guidelines ensure that data is secure, consistent, and aligned with institutional goals. At the same time, the structure and management of data – the core of data organization – significantly influences governance. As institutions evolve, changes in how data is stored, shared, and analyzed often necessitate updates to governance policies. Well-aligned data governance not only standardizes data definitions and security measures but also breaks down silos and encourages cross-unit collaboration for the common institutional strategic goals. This dynamic interplay is particularly important in complex, decentralized environments like higher education. Adopting Anthony Giddens's Structuration Theory (Gidden, 1984) and Orlikowski's Structurational Model of Technology (Orlikowski, 1992, 2007), this study proposes a new theoretical framework – Structuration Data Governance Model – to analyze the interaction between data governance and data organization. It also suggests practical applications of the theory.

KEYWORDS
Data Governance, Data Organization, Data Model, Structurational Theory

INTRODUCTION
In higher education, it is common to implement comprehensive enterprise resource (ERP) planning systems to manage core administrative and operational data, including student records, course information, financial aid, employment, and financial data. Other information management systems such as a learning management system (LMS), research data, and publication data management systems are often independently operated by designated units. Some of these systems are integrated with the core ERP to streamline business processes, enabling institutions to collect and store a large volume of data from diverse sources (Leonardi, 2009). However, the data collected is often not easily accessible to stakeholders and lacks systematic organization, which hampers its potential to inform decision-making processes (Daniel, 2015; Szukits & Móricz, 2024). While a vast amount of data provides opportunities to take a comprehensive approach to explore multiple aspects of phenomena, it also introduces challenges particularly around organizing and integrating data in a way that stakeholders can access and use relevant information efficiently (Abraham et al., 2019; Attaran et al., 2018). Discussions about leveraging data to enhance decision making often highlight two interconnected concepts: data governance and data organization. Data governance establishes the framework for managing data, defining the rules, security, and responsibilities to maintain data integrity (Abraham et al., 2019; Brous et al., 2016). Data organization focuses on the logical structures and the contextual classification of data. Effective governance of data is critical for both operational and strategic decision making (Alhassan et al., 2016). At the practical level, higher education institutions must standardize data governance policies and procedures in alignment with institutional values and strategic planning goals (Al-Ruithe et al., 2019; Bento et al., 2022; Jim & Chang, 2018). To support decision-making efforts effectively, data governance structures help define how data is classified and managed (Marcucci et al., 2023; Micheli et al., 2020) and are essential for ensuring data integrity, especially as a precursor to data analytics (Attaran et al., 2018).

DATA GOVERNANCE PRACTICE IN HIGHER EDUCATION
Higher education institutions increasingly recognize data as a vital organizational asset. To manage the valuable data asset, data governance plays a key role by establishing structures and policies that guide data through its lifecycle – from collection through analytics – while deriving values at each stage (Khatri & Brown, 2010; Marcucci et al., 2023). In higher education, however, developing standardization guidelines and procedures is challenging due to varying levels of understanding of the data landscape and lifecycle across institutional units. Research indicates that individual units often establish their own norms and best practices (e.g., data management and assessment) autonomously based on their accountability frameworks and operational needs (Brown, 2017; Lloyd, 2016). Brown (2017) emphasizes the need for fostering coordinated, cross-functional discourse to bridge the unit-based normative boundaries. Indeed, an opinion survey that Guy and Sun (2025) conducted to 30 higher education practitioners (university administrators and data analytics specialists) found that data analytics specialists often encounter *information silos* when working with administrators. Silo environments undermine data integration and alignment due to a lack of contextual interoperability – the ability to share data across units while retaining its semantic context

(Batko & Ślęzak, 2022; Saberi et al., 2025). Effective data governance can enhance data organization by standardizing definitions and enforcing security measures to break down silos and foster cross-unit collaboration. Integrating heterogeneous data sources requires a thorough understanding of business processes and domain expertise, typically managed by data stewards. By aligning data governance and data organization, institutions can better integrate and standardize disparate data.

STRUCTURATIONAL DATA GOVERNANCE MODEL

Structuration Theory approaches social structure and agency (human behavior) as being co-existed and influencing each other (a duality of structure). Social structure (rules and resources) simultaneously enables and constrains agency, which constantly evolved through social processes (Gidden, 1984; Dépelteau, 2008; Jones & Karsten, 2008). Orlikowski (1992) introduced the duality of technology and developed the Structurational Model of Technology with three components: 1) Human agents, 2) Technology, 3) Institutional properties of organizations. Adapting this theory, this study proposes a conceptual framework to examine the duality between data governance and data organization in a higher education environment.

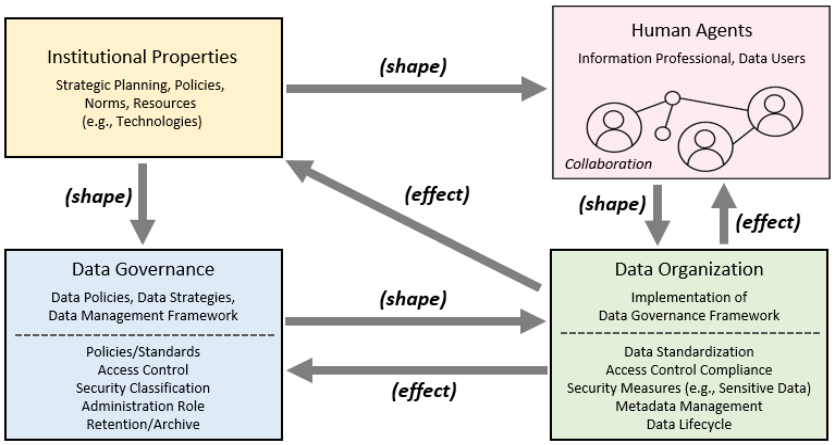

Figure 1. Structurational Data Governance Model

The Structurational Data Governance Model presented in Figure 1 is grounded in practical experience and empirical knowledge in higher education. It is an explanatory framework that is itself recursive and subject to refinement. It offers a conceptual lens to examine the dynamic interplay between data governance, data organization, and human agents. The model acknowledges that a data governance framework influences how data is logically organized – for example, through classification based on data asset ownership. At the same time, data organization (e.g., data management) impacts and is being impacted by human agents. These interactions can, in turn, reshape governance practices. This dual influence is central to strategically and responsively managing institutional data assets.

DISCUSSION

Despite the growing availability of data, higher education has lagged in adopting data-driven practices. The potential of data analytics and the importance of data accountability remain underutilized (Attaran et al., 2018; Daniel, 2015; Stojanov & Daniel, 2024). Bridging theoretical frameworks with practical application is especially critical when analyzing phenomena within complex organizational environments (Feldman & Orlikowski, 2011). The Structurational Data Governance Model facilitates systematic data organization, which is required for the strategic use of data, such as, through data analytics platforms. Building analytic data models requires accurate and consistent data. Integrating data from disparate sources needs standardized taxonomies, interoperable formats, and robust security protocols. For example, aligning student data across admissions, advising, and retention systems might need a common schema and shared definitions. A model that supports this kind of integration while allowing flexibility for unit-specific needs is vital for enabling strategic decision-making. In this context, the Structurational Data Governance Model offers a scalable and adaptable approach that can support both operational efficiency and long-term planning. Institutions can apply the model to break down data silos, improve data quality, and align data practices with institutional priorities in areas like enrollment management, student success, and research activities.

FUTURE WORK

This study introduced a new theoretical model, which was built on Giddens's Structuration Theory and Orlikowski's Structurational Model of Technology. It is adapted specifically for incorporating data governance in higher education to facilitate the development of data organization models that will promote cross-unit collaboration and transparency. Future work will focus on the application of the model: how it can be implemented, evaluated, and refined for improvement.

GENERATIVE AI USE

We, the authors, confirm that we did not use generative AI tools/services to authors this submission.

AUTHOR ATTRIBUTIONS

Yoshiko Okano Guy: conceptualization, visualization, investigation, writing – original draft, writing – review and editing; Ying Sun: conceptualization, supervision, writing – review and editing.

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Unequal AI Access Enhances Team Productivity through Negative Socio-emotional Reactions and Cognitive Diversity

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ABSTRACT
Although generative AI is widely recognized for its potential to enhance team collaboration, unequal access among team members is often overlooked. To explore how this seemingly detrimental uneven AI integration impacts team composition and, consequently, team effectiveness, this study extends the classic Input-Mediator-Output (IMO) model to an Input-Process-State-Output (IPSO) framework. A lab experiment with 60 two-person teams reveals that unequal AI access yields the highest productivity, improving both task quality and completion time compared to no or full AI access. This effect is driven by two key mechanisms. First, negative socio-emotional interactions and increased cognitive diversity serve as a positive serial mediation pathway linking unequal AI access to enhanced task quality. Second, unequal AI access leads to more concentrated and imbalanced questioning behaviors, accelerating task completion. This study provides a theoretical explanation of how AI integration structures operate in teams and offers guidance for the design and management of human-AI systems.

KEYWORDS
AI access; cognitive diversity; team interaction processes; team productivity; human-agent teams

INTRODUCTION
The rise of generative AI (GenAI) is transforming team collaboration, yet unequal access remains common due to differences in expertise and acceptance (Humlum & Vestergaard, 2025). This creates diverse AI integration structures and raises questions about their effects on team processes and output. Existing literature presents a theoretical debate: some argue that full access ensures equal participation (Bayerl et al., 2016) and supports shared learning (Majchrzak et al., 2005), others suggest that limited access may foster deeper interactions (Zhang et al., 2023) and diverse expertise (Doshi et al., 2024).

To address this debate, we build on O'Neill et al. (2023)'s new extension of the classic Input-Mediator-Output (IMO) model (Hackman, 1978; Ilgen et al., 2005; Marks et al., 2001) to the Human-agent teams (HATs) context and propose two refinements. First, we treat GenAI integration as a team composition input with three conditions: no, partial, and full access, rather than a binary AI presence. This distinction helps capture how unequal AI access can create dynamics like asymmetric information distribution, divergent expectations, and shifts in perceived social status, which can reshape team interactions and performance. Second, we delineate two important mediators—interpersonal processes (e.g., planning, communication, coordination) and emergent states (e.g., trust, shared mental models, situation awareness, or affective states)—into two consecutive steps, forming an Input-Process-States-Output (IPSO) model, as states are dynamic and continuously shaped through interactions.

In this current study, we focus on interpersonal communication behaviors as the 'Process' factor and cognitive diversity as the 'State' factor within our IPSO model. By empirically testing how different GenAI access structures influence team processes and emergent states, we aim to understand how these dynamics affect productivity outcomes such as task quality and completion time. Our central research question is:

RQ: How do varied GenAI integration structures affect team productivity via the serial mediation mechanisms of team interaction processes and cognitive diversity?

A key issue is the paradox surrounding the impact of unequal GenAI access on team productivity *(H1)*. By creating informational asymmetries and differentiated status expectations, unequal access gives rise to diverse task-related perspectives and contributions—commonly referred to as cognitive diversity, which is defined as the range of information, information processing styles, and perspectives of members (Gurkan & Yan, 2023; Sauer et al., 2006). As such, cognitive diversity emerges as a potential explanation for this ongoing debate. First, uneven AI integration creates information asymmetry, reducing redundant discussions and prompting non-AI users to rely more on personal expertise, thus encouraging more divergent perspectives (Gurkan & Yan, 2023). Second, unequal access empowers those with AI capabilities, reinforcing task specialization and social status differentiation (Rogers et al., 2009), which are key dimensions of cognitive diversity (Mello & Rentsch, 2015). Given its well-established and complex relationship with team outcomes such as task quality (Gomez & Lazer, 2019; Schumpe et al., 2023) and time (Li et al., 2022; Mohammed & Schillinger, 2022), we propose cognitive diversity as a mediator between AI integration structures and team productivity without predicting directionality *(H2)*.

To better understand how team interaction behaviors influence cognitive diversity, we will use Bales' Interaction Process Analysis (IPA) to classify four specific types of communication behaviors (positive/negative reactions in the socio-emotional area and questioning and answering reactions in the task area) and explore how they potentially alter task-related information flow and contribute to cognitive divergence among members. In the socio-emotional area, we propose that unequal access may reduce positive socio-emotional behaviors, such as support or agreement, due to perceived unfairness and reduced psychological safety (Cronin et al., 2011) but simultaneously increase disagreement that surfaces hidden perspectives and stimulates cognitive elaboration (Lu et al., 2012). In the task area, uneven information distribution and status cues may lead non-AI users to ask more questions and AI users to provide more answers, concentrating communication around specific individuals (Rogers et al., 2009; De Jong et al., 2022). These interaction patterns—both socio-emotional and task-related—serve as behavioral pathways linking unequal AI access and cognitive diversity and shape how it ultimately impacts team outcomes *(H3)*.

METHOD

We conducted a randomized and controlled laboratory experiment to examine how different AI integration structures influence team cognitive diversity and task performance through a press release writing task, following Noy and Zhang (2023). The study recruited 120 students from various majors at a university in China, who were randomly assigned into 60 two-person teams.

This study selected Kimi 3.0, a large language model developed by the Chinese company Moonshot, as the generative AI tool for team use. The procedure consisted of two phases. In the control phase, neither team member could use GenAI (no access condition). In the treatment phase, teams were randomly assigned to one of two conditions: only one member could use GenAI (unequal access), or both members could use it (full access). There was no restriction on how to interact with Kimi, and task execution was monitored via recordings.

In this study, cognitive diversity was measured using a computational text analysis approach with the Universal Sentence Encoder (USE) to calculate the cosine distance between team members' utterances. Team interaction behaviors were manually coded based on Bales' Interaction Process Analysis (IPA).

FINDINGS AND DISCUSSION

Through a PROCESS macro analysis, which demonstrated a good fit to the data (χ^2 (6, N = 60) = 4.243, p = .644), four key patterns emerged (see Figure 1 for the results). First, teams with unequal AI access improved task quality by improving team cognitive diversity. Second, in the socio-emotional area interactions, unequal AI access sparked more negative reactions, like disagreement. In the task area interactions, it led to more concentrated task-related questioning and answering, with certain team members taking the lead in asking questions and others concentrating on answering them. Third, there exists a positive serial mediation path from unequal AI access (versus full access) to improved task quality, sequentially through increased negative socio-emotional behaviors and greater cognitive diversity. In other words, although unequal access led to more disagreement among team members, this also encouraged a broader range of thinking styles—ultimately helping the team perform better. Fourth, more concentrated task-related questioning explains why unequal AI access (versus full and no access) reduced task time.

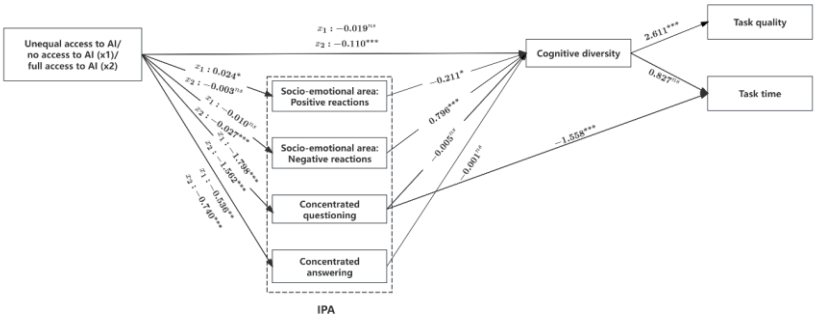

Figure 1. Results of the Mediation Model (with Unequal Access Condition as Reference Group). *Note. *** p < .01, ** p < .05, * p < .1, ns 'not significant'. Other non-significant paths are omitted*

This study makes both theoretical and practical contributions. Theoretically, it clarifies conflicting perspectives on the relationship between unequal AI access and team productivity through the lens of cognitive diversity. Additionally, our IPSO model proposes a comprehensive influence pathway—from AI integration structure as a team input, through observable team interaction behaviors and cognitive emergent states, to team productivity such as task quality and completion time. Practically, the findings suggest that rather than simply pursuing equal access across all members, HATs' managers and system designers should consider the strategic allocation of GenAI based on task goals. For short-term, innovation-focused tasks such as debates or brainstorming sessions, a certain degree of cognitive divergence caused by differentiated AI usage may be beneficial.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Han Jiaxuan: conceptualization, data curation, investigation, formal analysis, visualization, writing - original draft preparation; Ren Ruqin: conceptualization, methodology, project administration, funding acquisition, supervision, writing - review & editing.

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Unequal AI Access Leads to Greater Team Communication Style Differences and Better Task Performance

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ABSTRACT
The widespread use of generative AI (GenAI) is seen as beneficial for team collaboration, yet full access for all members is often impractical in real-world settings. This study explores how different GenAI integration structures—no access, unequal access, and full access—affect team performance, focusing on the mediating roles of team communication style differences and communication effectiveness. Findings from a lab experiment involving 60 two-person teams reveal that teams with unequal GenAI access demonstrate higher communication style differences and superior performance compared to teams with no AI or full access to AI. Two mediators—team communication style differences and communication effectiveness—sequentially mediate the impact of unequal AI access on enhanced team performance. This research provides theoretical insights into the effects of varied GenAI integration structures on human-AI collaboration and offers practical guidance for optimizing team design in human-agent systems.

KEYWORDS
AI access; team communication; dominant style; team communication effectiveness; team performance

INTRODUCTION
The widespread adoption of generative artificial intelligence (GenAI) is reshaping team collaboration and performance. However, real-world human-agent teams often experience unequal access to GenAI due to differences in expertise, experience, and acceptance (Humlum & Vestergaard, 2025). This disparity in AI usage raises critical questions about how AI integration structures influence human-agent collaborative teams. Our central research question is:

RQ: How does AI integration structure impact team communication and performance?

Existing research on AI adoption in teams has three key limitations. First, AI adoption is often treated as a binary state (present or absent), overlooking nuanced AI integration structures that better reflect real-world practices (Feuerriegel et al., 2024; Han et al., 2024). Second, there is no consensus on whether unequal AI access benefits (Raisch & Krakowski, 2021) or harms (Bayerl et al., 2016; Simaremare et al., 2024) team performance. Third, the mechanisms linking AI integration structures to team performance remain unclear (Li et al., 2024).

This study addresses these gaps by investigating how three types of AI integration structures—no AI access, unequal AI access, and full AI access—affect team performance and communication dynamics. While GenAI is widely believed to enhance collaboration, prior research presents conflicting views on how AI should be distributed within teams. Some argue that unequal AI access allows teams to strategically concentrate cognitive and informational resources, improving efficiency and diversity of outputs (Zhang et al., 2023; Doshi et al., 2024). Others suggest that full AI access ensures equal participation (Bayerl et al., 2016; Simaremare et al., 2024), reducing conflicts (Bendersky & Hays, 2012), and supports shared learning (Edmondson, 1999; Majchrzak et al., 2005). Based on this ongoing debate, we propose competing hypotheses: teams with unequal GenAI access may outperform those with no or full access *(H1a)*, while alternatively, teams with full access may demonstrate superior performance *(H1b)*.

To explain these potential differences in outcomes, we turn to examine how these AI integration structures shape team communication dynamics, particularly dominant communication style asymmetries. Drawing on status characteristics theory (Berger et al., 1980; Correll & Ridgeway, 2003), individuals granted access to GenAI may perceive themselves as more competent and are more likely to adopt dominant roles in team discussions (Meeussen & Van Dijk, 2016). Simultaneously, AI-generated informational asymmetries (Rogers et al., 2009) can reinforce these status differences, leading non-users to adopt more passive roles. Building on these effects, we argue that individuals with AI access become more dominant *(H2a)*, while non-users become more submissive *(H2b)*, leading to greater communication style differences under unequal AI access at the team level *(H2c)*.

Such asymmetries can influence team communication effectiveness, which ultimately shapes team performance. On one hand, dominance-based communication style differences may enhance clarity and coordination (Pasarakonda et al., 2021); on the other hand, they may hinder open information exchange and reduce effectiveness (Tost et al., 2013). Therefore, we propose that communication style differences first impact effectiveness *(H3)*, which then

mediates the effect of AI access structure on team outcomes *(H4)*. The integrated theoretical model is illustrated in Figure 1.

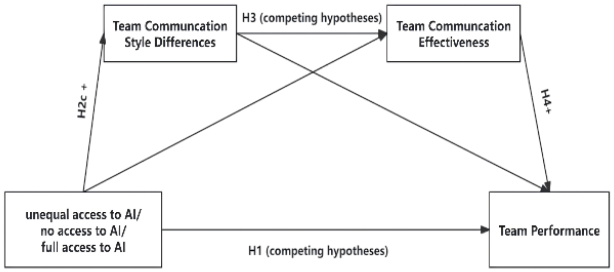

Figure 1. Team-level Effect of AI Access on Team Performance: A Serial Mediation Model

METHOD

We conducted a randomized controlled laboratory experiment to examine how different AI integration structures influence team communication styles and task performance through a press release writing task. The study recruited 60 university students from various majors, and they were randomly matched with one of five confederates, trained to display a neutral communication style across conditions and phases, to form 60 two-person teams.

This study selected Kimi 3.0, a large language model developed by the Chinese company Moonshot, as the generative AI tool for team use. Each team first went through a control phase task where neither member was permitted to use GenAI to complete the writing task (without access to AI condition). Then, in the treatment phase, these teams were randomly assigned to one of three AI integration conditions: only the participant was allowed to use AI. Only the confederate was allowed to use AI (these two conditions will be grouped into unequal access to AI condition), or both were allowed to use AI (full access to AI condition).

According to Noy & Zhang (2023), team performance was evaluated by nine marketing experts, who rated submissions based on writing quality, content quality, and originality, using a 1-7 scale. Regarding Communication Style, this study measures an individual's dominant communication style as the average of teammate-rated (Burgoon and Dunbar, 2000) and coder-rated dominance (Sarhadi, 2016). The team-level communication style difference is calculated as the absolute difference in dominant style between two team members. Based on Kramer et al. (1997), team communication effectiveness was assessed using a 10-item, 7-point Likert scale.

FINDINGS AND DISCUSSION

The results show that teams with unequal AI access outperformed both no-access teams (b = -0.687, $p < .01$) and full-access teams (b = -0.444, $p < .05$), supporting *H1a*. The PROCESS macro model, which has good model fit (Chi-Square Test of Model Fit for the Baseline Model χ^2 = 175.190, df = 18, $p < .01$), further reveals that unequal AI access increases communication style differences (*H2c*) (relative to no AI access: b = -0.832, $p < .01$; relative to full AI access: b = -0.692, $p < .01$), which in turn enhances communication effectiveness *(H3)* (b = 0.308, $p < .01$), ultimately boosting performance (b = 0.455, $p < .01$) *(H4)*. Communication style differences and effectiveness serve as serial mediators (relative to no AI access: b = -0.117, SE = 0.037, 99% CI [-0.234, -0.038]; relative to full AI access: b = -0.097, SE = 0.038, 95% CI [-0.192, -0.038]). These results suggest that unequal AI access causes some team members to take a dominant role, enhancing communication efficiency and ultimately improving team performance.

At the individual level, findings suggest that AI's empowering effect explains team-level patterns. Under unequal AI access, members with AI access adopt more dominant communication styles (b = 1.346, $p < .01$), while non-users exhibit more submissive behaviors (b = -1.420, $p < .01$).

This study contributes to the growing literature on human-agent teaming (HAT) by uncovering how varied GenAI integration structures influence team dynamics and performance. Rather than assuming uniform AI access is ideal (Bayerl et al., 2016; Simaremare et al., 2024; Endersby et al., 2017), we show that unequal access can enhance team outcomes by creating asymmetries in communication styles—empowering AI users to adopt more dominant roles and prompting non-users to take more submissive ones. These differences improve communication effectiveness and task coordination. Theoretically, this positions GenAI as a structuring agent that reconfigures human-human interaction within HATs, not merely a support tool. It highlights the importance of considering how access disparities impact communication roles and team function. Practically, the findings inform a more strategic approach to GenAI deployment: selectively allocating AI access can foster complementary roles and improve collaboration in short-term task-oriented teams. This work offers both conceptual and actionable insights for designing effective human-agent teams in sociotechnical environments where AI plays an increasingly embedded role.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Han Jiaxuan: conceptualization, data curation, investigation, formal analysis, visualization, writing - original draft preparation; Ren Ruqin: conceptualization, methodology, project administration, funding acquisition, supervision, writing - review & editing.

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How Academic Structure Shapes Research Focus in Library and Information Science Schools

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ABSTRACT
This study examines how academic structure influences research focus in Library and Information Science (LIS) schools. We analyzed 16,671 publications from 745 faculty across 42 U.S. programs. Schools with independent LIS units demonstrate diverse research portfolios, while those sharing administration show variations: computer science affiliations emphasize technical topics with minimal traditional library research, education affiliations focus on library science and metadata, and communication affiliations balance traditional areas with social media research.

KEYWORDS
Library and Information Science Research; Academic Structure; Bibliometrics

INTRODUCTION
Library and Information Science (LIS) has epitomized the norm of interdisciplinary study since its inception. Scholars have examined the interdisciplinarity of LIS from various angles, including research performance (Yu et al., 2024), teaching curriculum (Urs & Minhaj, 2023), and historical shifts in iSchool structures (Renear & Wei, 2022). Nonetheless, with data science emerging as a pivotal field, LIS schools have faced challenges in determining whether to adapt their organizational structures to the evolving landscape of data science (Vostal, 2016; Shah et al., 2021).

The topic of school composition and restructuring has long been a subject of discussion across diverse research fields (Huge, 1978). This aspect of university strategic planning, often referred to as Organizational Structure, concerns the organization of individuals, the division of tasks, and the coordination of these tasks (Nyathi & Bhebhe, 2019). Such topics are frequently explored within pedagogy and sociology, where it's highlighted that organizational structure is intertwined with the study of knowledge legitimation—specifically, how organizational contexts contribute to the social construction of knowledge (Gumport & Snydman, 2016). In the context of our study, the academic structure of a LIS school mirrors how it articulates its values of interdisciplinarity. In this study, we aim to build an understanding of how the academic structures of LIS influence their research and identify patterns and trends in research topics and to assess the extent to which structural configurations affect the focus and diversity of scholarly work in LIS.

DATA AND METHODS
We use the list of Best Library and Information Studies Programs from U.S. News and World Report to select schools for this study, in which there are 55 schools. Schools that only offer a LIS degree program without an academic unit of LIS are excluded. 44 out of 55 schools have a dedicated academic unit of LIS with full-time faculty. We examined these 44 schools by visiting their website to code their academic structure, identifying five major types:

- **LIS-I**: LIS units are standalone and independent (22 schools)
- **LIS-CS**: LIS units share administration with computer science (4 schools)
- **LIS-COM**: LIS units share administration with communication disciplines (7 schools)
- **LIS-EDU**: LIS units share administration with education disciplines (7 schools)
- **LIS-AS**: LIS units are in the College of Arts and Sciences (4 schools)

We collected 910 full-time faculty members (tenure-track and non-tenure track) from the 42 schools using AI-assisted extraction from faculty directory pages. Faculty publications were collected using Dimensions Analytics API. After name disambiguation and validation, 752 faculty members were matched with unique researcher IDs. For each ID we retrieved all works including research article, conference paper, research chapter, or review article. The raw pull (22,259 records) was deduplicated to 16,792 items by collapsing pre-print / published pairs. We used SPECTER2 (Singh et al., 2022) to create embeddings of publications and BERTopic (Grootendorst, 2022) to identify research themes; two outlier themes ("Quantum Communication" and "Atmospheric Chemistry") published by a couple of LIS faculty members were removed, yielding a clean dataset of 16,671 publications spanning 2014-2024.

RESULTS
We identified 14 distinct research themes (Figure 1, left). The research landscape shows clear clustering of related themes, with traditional LIS areas (Library Science and Metadata & Archives) positioned separately from emerging

technical fields (AI and Privacy & Security). Human-Computer Interaction research occupies a central position, reflecting its interdisciplinary nature. Publication trends from 2014-2024 (Figure 1, right) show overall field growth of 3.2% annually, with 16,671 total publications. Emerging areas demonstrate strong growth: AI and Human research shows the highest growth at 9.1% annually, followed by Computing Education (5.4%) and Health Information Technology(5.0%). Information Retrieval (-1.7%) and Privacy & Security (-1.7%) show slightly declining trends, while traditional LIS areas, such as Library Science (3.2%) and Metadata & Archives (1.2%), maintain steady growth.

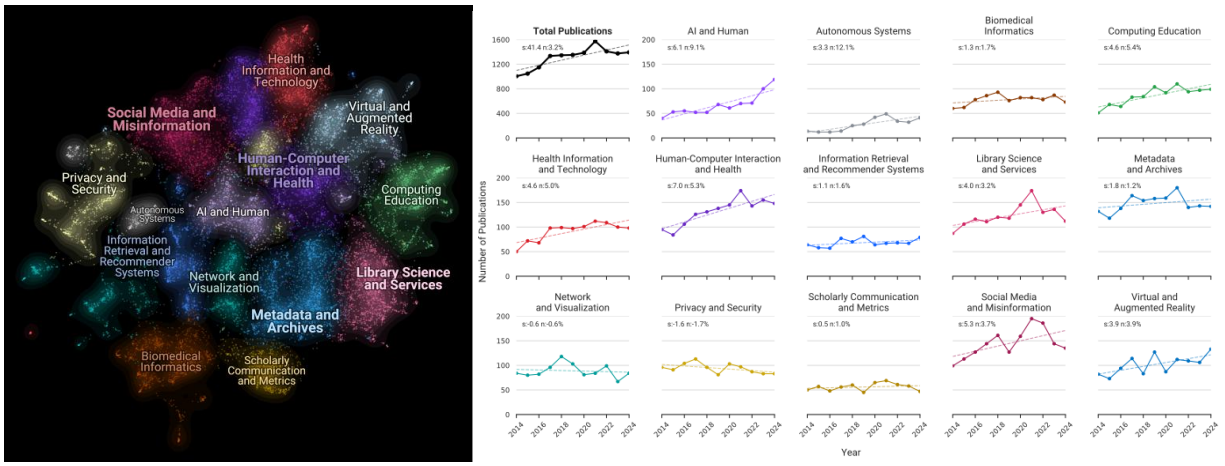

Figure 1. Research trends and landscape in LIS from 2014-2024. Left: Research landscape map where each point represents a publication colored by topic assignment. Right: Publication trends showing overall growth (top panel) and individual topic trajectories over time, with slope (s) and normalized annual growth rate (n).

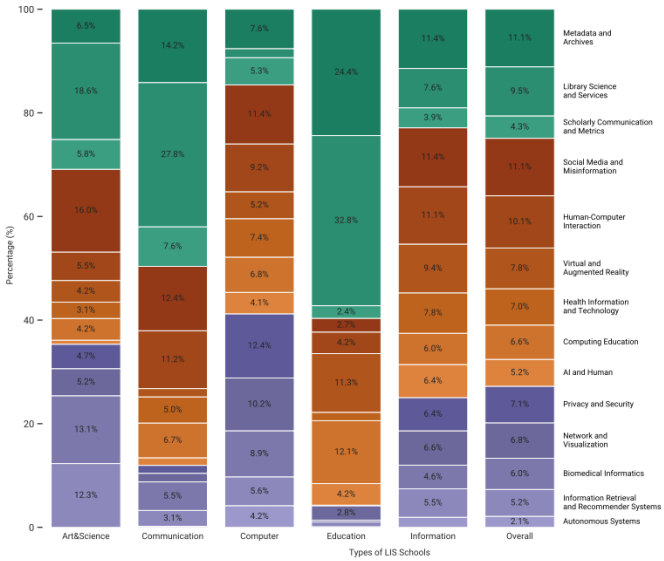

Figure 2. Distribution of research topics across different types of LIS academic structures. The color present three groups of research theme: Information Organization and Library (green), Human-Centered Computing and Social Informatics (orange), and Computing Systems (purple).

Different school types exhibit distinct research profiles (Figure 2). LIS-EDU schools show the strongest focus with 32.8% Library Science and 24.4% Metadata & Archives. LIS-COM schools similarly emphasize Library Science (27.8%) while maintaining significant focus with Social Media research (12.4%). In contrast, LIS-CS schools demonstrate a highly technical orientation with minimal library research (1.74% Library Science) but a strong focus on Privacy & Security (12.38%) and Network & Visualization (10.19%). LIS-I and LIS-AS schools display the most diverse research portfolios, with relatively balanced coverage across all 14 themes.

CONCLUSION

Our analysis demonstrates that academic structure significantly influences research focus in LIS schools, with computer science affiliations driving technical specialization, education affiliations focusing traditional library services, and communication affiliations emphasize social media research. While independent LIS schools maintain the broadest interdisciplinary profiles, variations within these schools need further investigation.

GENERATIVE AI USE

We employed OpenAI API (GPT 4.1) for the following purposes: extracting faculty information from university web pages and enhancing manuscript clarity. We evaluated the output by manual verification and validation. The authors assume all responsibility for the content of this submission.

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Conversations Reimagined: Human-AI Collaboration in Analyzing How Creators Explain Security and Privacy Tools

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ABSTRACT

This study experimentally reproduces the methodology of Akgul et al. (2022) on influencer VPN advertisements, adapting it to a Taiwanese context while integrating extensive generative AI (GAI) support. We developed a three-stage GAI assisted pipeline: transcription using OpenAI's Whisper, segment identification via prompt-based querying with Google's Gemini API, and performance assessment against human annotations. This hybrid human-AI workflow reduces the manual screening burden while preserving analytical rigor, allowing researchers to concentrate on interpretive analysis. The study demonstrates how qualitative research can evolve through experimental integration of AI tools, augmenting human expertise rather than replacing it—particularly in culturally specific domains such as cybersecurity communication in Taiwan.

KEYWORDS

Information security; VPN advertisements; qualitative analysis; Generative Artificial Intelligence

INTRODUCTION

The processing of large-scale digital content and the task-shifting between data collection, processing and content analysis phases often create challenges where researchers must repeatedly communicate and refine to achieve the consistency of the collection standard, processing details, and codebook (Fazeli, Sabetti, & Ferrari, 2023; Bingham, 2023), which not only leads to technical barriers for social science researchers who lacks programming expertise or resources to conduct a comprehensive automated data collection (Palys & Atchison, 2012), but also limits the flexibility of adjusting or refining the dataset during the research process.

To address these methodological questions, we applied our generative AI-assisted framework to cybersecurity knowledge dissemination. Cybersecurity content features dense technical terminology (Reeder et al., 2018), presenting users with comprehension and communication challenges (Das et al., 2018), while rapidly evolving threats necessitate ongoing methodological adaptations (Krombholz et al., 2015). This domain ideally showcases our framework's strengths and addresses the terminology-intensive, dispersed content that challenges traditional qualitative research approaches.

With the growing importance of online media platforms as influential sources of information communication (Kross, Hargittai, & Redmiles, 2021), the Virtual Private Network (VPN) industry actively collaborates with content creators to leverage their connections with audiences, using phrases like "This video is sponsored by (brand) VPN" to signal its sponsorship on popular YouTube videos and podcasts. Additionally, the narratives and rhetorical strategies applied in VPN advertisements have great potential to mislead or confuse the non tech-savvy audiences, influencing their understanding of security and privacy protection practices (Akgul et al., 2024). Another previous research by Akgul et al. (2022) also conducted a random sampling of English-language YouTube videos to examine how content creators collaborated with VPN companies in advertising, inspiring our exploration of its implications in Taiwan, where public cybersecurity education remains an emerging concern.

Given the complexity and scale of video content available on Taiwanese platforms and the challenge of manual annotation, we introduced generative AI-assisted methods across data collection, processing, and analysis. By applying this innovative methodology to culturally specific material, we aim to analyze how the public discusses cybersecurity knowledge across various online media platforms, and how content creators incorporate sponsored VPN advertisements into their content, focusing on their use of security terminology, metaphors, and persuasive strategies they use to explain these privacy tools to general audiences.

AUTOMATING DATA COLLECTION WITH GENERATIVE AI

Our research started with a small-scale manual annotation, we then applied NLP tools and large language models to bridge video collection and content analysis. We first constructed a dataset centered on the detection of VPN

sponsorships. From the top 100 YouTube channels in Taiwan (as listed on Wikipedia), ten were randomly selected to ensure genre diversity. All videos from these channels published over a 180-day period (150 in total) were collected and annotated for (1) any sponsorship and (2) VPN-specific sponsorships. This annotated dataset served as the foundation for downstream model development and evaluation.

Building on the manually annotated dataset, we introduced a three-stage pipeline to support scalable content retrieval and iterative evaluation. The process involves (1) transcription, (2) segment identification via prompting, and (3) performance assessment against human annotations. The complete workflow is depicted in Figure 1.

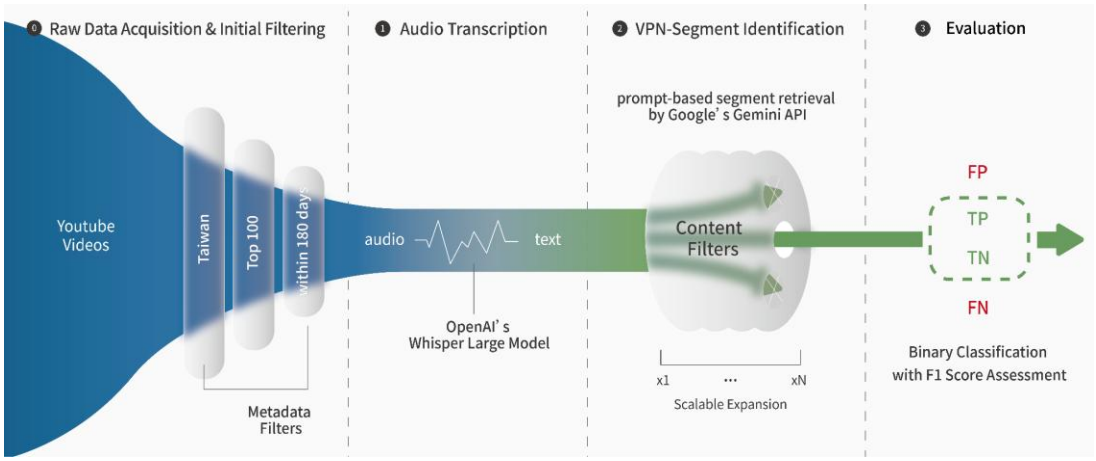

Figure 1. AI-assisted workflow for transcribing, identifying, and evaluating VPN sponsor segments in videos

We improved on Akgul et al. (2022) by using LLMs (Whisper, Gemini API) to enhance data screening and streamline audio-to-text conversion—especially for Mandarin videos, which often lack accurate subtitles. This reduced dependence on platform transcripts and improved screening accuracy.

YouTube Audio Transcription. To convert video content into inputs suitable for large language model (LLM) processing, we extracted audio tracks using youtube-dlp and transcribed them into full-text transcripts. Transcription was performed using OpenAI's Whisper Large, a multilingual speech-to-text model chosen for its adequate accuracy on mixed-language content and acceptable runtime efficiency.

VPN-Segment Identification. We applied a prompt-based segment retrieval using Google's Gemini API to identify transcript segments containing VPN sponsorships. The goal was to construct a scalable pre-screening layer—reducing the manual burden while maintaining sensitivity to subtle or variably placed sponsorship content. Incorporating AI-assisted segmentation helps shift human effort from routine detection to interpretive analysis and saves time spent reviewing entire transcripts to locate short sponsored segments during manual annotation.

Evaluation Method & Tool. To evaluate performance and guide prompt refinement, we framed VPN sponsorship identification as a binary classification task operationalized via prompting. The model returned a transcript segment if VPN sponsorship was detected; otherwise, it produced no output. Model outputs were evaluated against human annotations using confusion matrices (TP, FP, FN, TN) to compute precision, recall, and F1-score.

To support prompt iteration, we built a lightweight web tool that lets researchers test custom prompts, view model outputs, and instantly retrieve evaluation metrics (e.g., F1-score). The interface enables fast, reproducible prompt tuning and pattern discovery. We compared two prompting strategies: (1) End-to-End, directly querying for VPN content, and (2) Two-Phase, first detecting any sponsorships, then narrowing to VPNs. This comparison aimed to test whether staged prompting improved accuracy.

FUTURE RESEARCH PLAN

Based on the established methodology, we hope to explore a more complete method to process qualitative data and analyze the content carrying information security knowledge, in order to develop an evidence-based research solution to public cybersecurity education. With the AI-assisted workflows and prompt engineering demonstrated in this study, social science researchers can retain control over core analytical decisions while expanding their technical capabilities through dialogue with generative AI. This collaboration enables automation of tasks like identifying and extracting relevant media segments—previously reliant on intensive manual effort. Rather than replacing human labor, this approach exemplifies a human-centered model where GAI augments researcher expertise. Through iterative interaction, researchers and AI systems evolve together, showing that human-centered AI is achieved not through control, but through conversation.

DATA AVAILABILITY

The dataset, annotated transcripts, and code used in this study are openly available via an anonymous GitHub to ensure double-blind peer review. All scripts for transcription, prompt-based segment retrieval, and evaluation are included, along with a lightweight web interface for prompt testing and reproducibility. The repository can be accessed at: https://github.com/s3131212/youtube-vpn-ads-analysis

GENERATIVE AI USE

We utilized Gemini 1.5 Flash during the research phases to assist in identifying and extracting transcript segments that potentially contained VPN sponsorships. The AI's involvement was limited to this experimental setup, supporting prompt-based segment retrieval and preliminary classification. In the manuscript preparation phase, large language models including OpenAI's ChatGPT (GPT-4o and GPT-4.5) and Anthropic's Claude Sonnet 3.5 and 3.7 were employed for language refinement and stylistic polishing. Apart from these uses in data processing and editorial assistance, no generative AI tools were involved in the conceptual analysis or substantive writing of this paper—all analytical interpretations and core writing were conducted by the human authors.

AUTHOR ATTRIBUTION

Hsieh, Tsai-Hsuan: conceptualization; investigation; data curation; validation; writing – original draft; writing – review and editing. Lin, Yu-Jie: investigation; data curation; validation; writing – original draft. Huang, Yu-Wen: investigation; project administration; visualization; writing – original draft; writing – review and editing. Chou, Kai-Hsiang: data curation; methodology; software; validation. Li, An-Jie: data curation; methodology; software; validation. Kung, Li-Fei: investigation; project administration; writing – review and editing. Jeng, Wei: conceptualization; resources; funding acquisition; supervision; writing – review and editing.

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An Exploratory Study of Values and Gaps of Literacy in iCaucus Undergraduate Curricula

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ABSTRACT
Living in a rapidly evolving digital environment, various forms of literacy are crucial for students to navigate the transforming world. This study investigates the presence of literacy-related courses within undergraduate programs at iSchools. Using topic modeling, we analyzed 1,507 undergraduate course descriptions from 26 iCaucus schools in the North American region, identifying a total of 22 topics. Two noteworthy findings emerged: 1) only 28 literacy-related courses were identified across 12 institutions, and 2) these courses were scattered across eight different topics rather than forming a cohesive, standalone topic. These results reveal that literacy, in its various forms, is not currently a central focus in the design of undergraduate curricula within iCaucus schools. As a next step, we plan to expand our sample to include courses from iSchools across all membership levels and geo-regions and to further investigate how literacy-related content is integrated into broader curricular structures.

KEYWORDS
literacy, curriculum, iSchool, topic modeling

INTRODUCTION
Literacy is the gateway to knowledge. In addition to information literacy, the traditional core competency in library and information science (LIS), academia has increasingly emphasized various literacies essential for navigating the transforming world. For example, media literacy involves the ability to analyze, evaluate, compare, and interpret media content through accurate message comprehension (Potter, 2021). Digital literacy extends this by addressing the socio-technical, socio-economic, and socio-historical contexts of digital interactions (Nichols & Stornaiuolo, 2019). The rise of AI tools has introduced the need for AI literacy, which includes recognizing and understanding basic AI concepts, as well as using and critically evaluating AI outputs (Ng et al., 2021). To effectively adapt to social and technological changes, students must develop multiliteracy skills. Accordingly, practitioners may gain insight from reassessing current literacy education to identify and address existing gaps.

The iSchools is an important international community dedicated to LIS education and the curricula have served as valuable data sources for investigating the evolution of specific educational aspects. For example, Urs and Minhaj (2023) examined courses in 32 data science (DS) focused graduate-level programs in iSchools and mapped the findings onto existing DS knowledge frameworks. They highlighted current trends in DS education (e.g., data visualization) as well as areas needing further development (e.g., open science). Similarly, Walsh et al. (2021) identified 12 key topics from an analysis of 426 digital humanities (DH) courses offered in iSchools. Their comparison of course content with job market demands revealed that the competencies required for related positions are often not explicitly addressed in courses labeled as DH. These studies demonstrate that curriculum analysis reveals not only key differences between educational and research communities, but also gaps between academic instruction and workplace competencies. Accordingly, we applied this approach to address the following question: How are literacy-related courses taught in the undergraduate programs of the iCaucus schools?

RESEARCH METHOD
As of May 2025, iSchools have around 130 members across the globe. This study primarily analyzed undergraduate curricula offered by iCaucus schools in the North American region. iCaucus schools hold the highest level of membership and are committed to shaping the future of the information field (iSchools, n.d.), making our findings more representative. Schools in the North American region typically provide greater access to curricula in English, enabling more comprehensive data collection. Additionally, we focused on undergraduate courses due to the growing trend over the past decade of iSchools developing bachelor's degree programs.

In early May 2025, we collected a total of 1,595 courses through searching online course catalogues. After removing 88 courses (5%) due to missing descriptions, 1,507 courses from 26 schools remained in the sample. The min, max, and median courses per school are 7, 127, and 58.5 respectively. We began by using regular expressions to identify literacy-related courses if the course titles or descriptions contain "literacy" or "literacies." Following initial text cleanup, we applied BERTopic (Grootendorst, 2022), a topic modeling technique implemented in Python, to identify coherent topics within our sample. We used the default sentence-transformer model, "all-MiniLM-L6-v2," to embed course descriptions into a 384-dimensional dense vector space. We then applied UMAP to reduce the dimensionality to 100 before clustering with HDBSCAN. To evaluate the clustering results, we fitted separate models with minimum cluster sizes of 5, 10, 15, 20, and 50. The final model was selected based on the proportion of outliers and

the probability distribution of topic assignments. In addition, we performed lemmatization, removed English stopwords, and reduced the impact of frequent words to enhance topic representations. Finally, we examined how literacy-related courses are distributed across the topics identified in the iCaucus undergraduate curricula.

FINDINGS AND DISCUSSION

In total, 28 literacy-related courses are offered by 12 schools, accounting for 1.86% of our sample. The University of California, Los Angeles (UCLA) alone offers nearly one-third of these literacy-related courses (n=9). In the final model we selected (with minimum cluster size of 15), three courses were considered outliers, while the remaining courses were distributed across eight of the 22 topics identified. As shown in Table 1, the largest topic (Topic #0) has its central theme in information and society, and it also contains one-third of the literacy-related courses focusing on information literacy. The focuses of the remaining literacy-related courses can be loosely categorized as data/visualization literacy, language/cultural literacy, critical media literacy, and youth literacy. These are dispersed across technique-oriented topics such as data science and programming (Topic #1) and data and information visualization (Topic #17), education- (Topic #4) and communication-centered topics (Topic #14), as well as the more traditional library-focused topic on youth materials (Topic #19). The most representative terms within the selected topics relevant to literacy are presented in Figure 1.

Topic	Theme	Included (N=28)	Not included (N=1,479)
0	Information and Society	9 (32.1%)	259 (17.5%)
1	Data Science and Programming	2 (7.1%)	192 (13.0%)
2	Career and Professional Development	2 (7.1%)	134 (9.1%)
4	Education and Community Engagement	3 (10.7%)	77 (5.2%)
13	Health Informatics	1 (3.6%)	29 (2.0%)
14	Traditional and New Media	3 (10.7%)	26 (1.8%
17	Data and Information Visualization	2 (7.1%)	20 (1.4%)
19	Youth Literacy and Materials	3 (10.7%)	16 (1.1%)
–	Outlier	3 (10.7%)	183 (12.4%)

Table 1. Topic distribution of courses offered in the iCaucus undergraduate curricula in North America, in relation to literacy. Note. The table includes only topics that contain at least one literacy-related course.

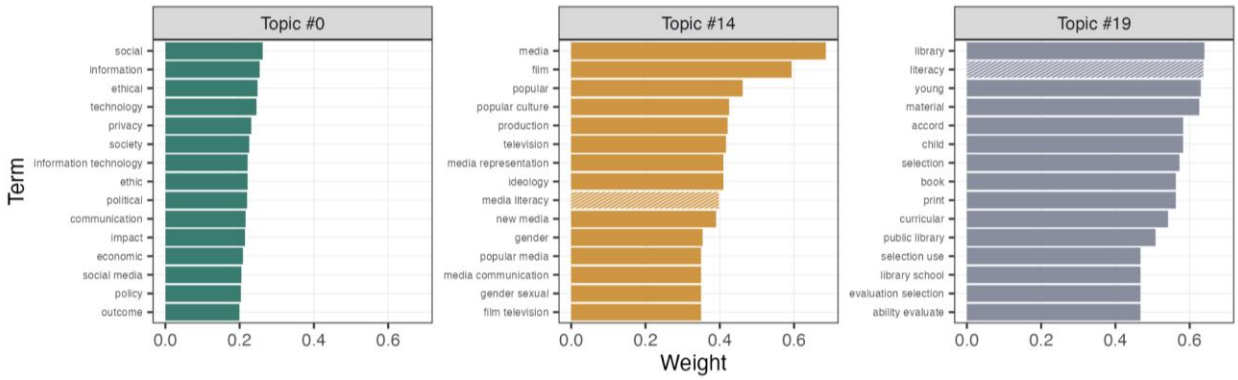

Figure 1. Selected topics relevant to literacy with top 15 representative terms. Terms containing "literacy" are highlighted with stripes.

It is surprising that only a small number of literacy-related courses are offered in iCaucus undergraduate programs in North America. Practitioners need to be more attentive to the current course structure. As the born-digital generation increasingly engages with vast amounts of information and emerging technologies, the need for educational training in critical thinking and digital citizenship is more pressing than ever to support students' professional development (Pekkolay, 2022). However, we acknowledge that this preliminary finding may be limited by the strict keyword-based criteria and the cross-sectional nature of our 2025 data. As a next step, we plan to expand our dataset to include courses from all program levels and iSchool tiers across all regions, and to examine how literacy-related courses are integrated with other curricular offerings.

GENERATIVE AI USE

We employed ChatGPT-4o for grammar checking and copy editing. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

LMH: conceptualization, investigation, data curation, writing – original draft, writing – review and editing; PYC: conceptualization, methodology, formal analysis, visualization, writing – original draft, writing – review and editing.

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Navigating AI Literacy: High School Students' Perspectives on AI Tools in a Human-Centered Information Landscape

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ABSTRACT
AI literacy is an emerging research topic, as various AI tools have become embedded in our everyday lives, particularly in the school context. The purposes of this exploratory study are twofold: 1) to investigate high school students' AI literacy and 2) to explore their experiences using AI tools in the context of coursework. A mixed-methods approach was employed, combining a survey questionnaire with interviews and information world mapping visual-elicitation method. The findings indicate that students generally perceived themselves as having a basic understanding of AI and expressed confidence in using AI tools. However, many still relied on human sources, such as peers, to learn how to apply AI in coursework. Notably, gender differences in AI literacy were also observed. These preliminary findings highlight the need for formal AI education and course development in high schools, which may have implications for educators in designing future AI curricula.

KEYWORDS
AI literacy, digital literacy, high school students, information world mapping

INTRODUCTION
Artificial intelligence (AI) has drastically reshaped the landscape of everyday life for people of all ages. AI literacy encompasses a range of competencies, including awareness of AI technologies, a basic understanding of AI functions and features, the ability to utilize AI tools for problem solving, and the capacity to critically evaluate the outcomes of AI applications (Carolus et al., 2023; Chiu et al., 2024; Laupichler et al.,2023; Long & Magerko, 2020; Ng et al., 2021; Su, 2024; Zhao et al., 2024). In the school context, to ensure students are prepared for this transformative technology, educators face an urgent need to equip students with AI literacy (Carolus et al., 2023; Ng et al., 2024; Wang et al., 2023). This exploratory study aims to investigate high school students' AI literacy and examine their experiences using AI tools in the context of coursework learning. The findings may have implications for educators in informing the design and development of future AI-related curricula in secondary education.

RESEARCH METHODS
We employed a mixed-methods approach using a survey questionnaire and interviews. The study population consisted of students from a high school in New Taipei City, Taiwan. All participants were voluntarily recruited from a 12th-grade class that had completed an English project-based lesson focusing on AI tools. Each student was required to select one AI tool to research and introduce to the class. Data collection was conducted in early May 2025 by a research team member who also teaches English at the school. The survey instrument was adopted from Chiu et al. (2021), translated into Traditional Chinese, and distributed via Qualtrics. It consisted of 25 items using a 5-point Likert scale to measure five aspects of students' self-perceived AI literacy: AI Knowledge (AIKG), AI Readiness (AIRD), AI Confidence (AICF), AI Relevance (AIRE), and Intrinsic Motivation to Learn AI (AIIM). In the original study, Chiu et al. (2021) assessed reliability using Cronbach's alpha, with all variables reporting α values above 0.8, indicating good internal consistency (Taber, 2018). At the end of the survey, participants were asked to provide demographic information and indicate their willingness to participate in an interview. The interview guide applied the information world mapping (IWM) visual-elicitation method by Greyson et al. (2017) to articulate relationships among people and items involved in their information activities. All interviews were conducted in a meeting room at the school. Students were asked to recall their information practices while working on an AI-tool introduction assignment and share their learning experiences and thoughts on using AI tools. Students were then asked to draw their IWM and describe how they view these sources, especially the role of AI tools in this coursework context. The entire process took an average of 1.5 hours. Students' narratives, along with their IWM, were analyzed using thematic analysis at an individual level.

FINDINGS AND DISCUSSION
This study presents preliminary findings based on data collected from 27 survey responses and nine interviews. The survey respondents included 10 males, 16 females, and one who chose not to disclose their gender, with an average age of 17.74. The interview participants consisted of eight males and one female, all of whom were 18 years old.

The survey results show that, after completing the AI tool learning project in their English class, participants reported moderate to high levels of self-perceived AI knowledge, readiness, and relevance (Mean ≈ 4) (Table 1). The interview results reveal that ChatGPT and Canva AI (or another AI presentation maker) are the primary gen-AI tools for high school students. While the conversations mainly focused on students' coursework situations (e.g., translation, brainstorming, outline structure, fact-checking/concept definitions, visual presentation creation), some students also mentioned their use of gen-AI tools in everyday life situations for daily decisions (e.g., P2, P9) or emotional support (e.g., P8). A variety of other tools were also mentioned by students. Nevertheless, there are discrepancies in students' familiarity with gen-AI tools. Some students have explored various tools (e.g., P1, P8, P9) while others haven't (e.g., P2). And even for those who have experienced various tools, they may not be able to clearly identify the tools they used and the specific functions they used. For instance, P8 spent some time figuring out what he used during the interview conversation. These findings indicate that while students generally perceive themselves as having a basic understanding of AI and express confidence in using AI tools, some may overestimate the extent of their actual knowledge.

On the other hand, students reported lower scores in AI confidence (i.e., confidence in their learning outcomes) and intrinsic motivation to learn AI (see Table 1). As non-native English speakers, it is possible that the class assessment of English oral presentations reduced students' confidence and motivation. In addition, students still relied on various non-AI sources to learn about AI. For example, P2, P4, P8, and P9 clearly expressed that they learned a specific AI tool from their classmates.

P3 used an interesting metaphor in his IWM (Figure 1) and reflected typical information practices among high school students for AI learning. He used a fish skeleton with information sources and devices used for coursework purposes. P3 with three hairs and his peers were below the fish. P3 depicted himself behind his peers because he mentioned he "*just started learning* [to use these tools]," and the sources he is more familiar with (such as Google products and YouTube) are prioritizing towards the head of the fish. Interestingly, he believes that Canva AI is like the fish fin that "*drove the process of preparing this assignment and made the whole process more effective*." Other students (e.g., P2, P4, P7) also emphasized the importance of using Canva AI to help prepare their presentations.

Variables	Mean (SD)	Mean-Male (SD)	Mean-Female (SD)
AIKG	3.92(0.82)	3.98(0.83)	3.81(0.80)
AIRD	4.13(0.87)	4.18(0.86)	4.15(0.88)
AIRE	4.01(0.90)	4.11(0.92)	3.92(0.87)
AICF	3.68(0.98)	3.68(1.13)	3.72(0.88)
AIIM	3.83(0.86)	4.03(0.91)	3.75(0.80)

Table 1. Survey result overview

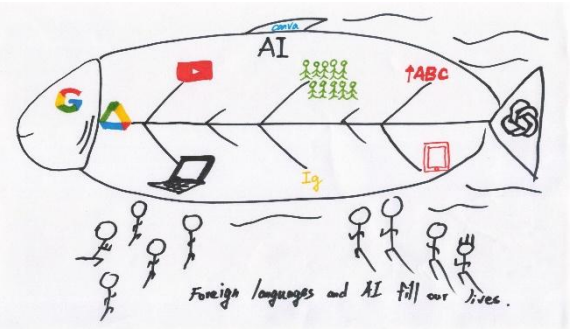

Figure 1. IWM of P3

Additionally, it is worth noting from the survey result that male students generally reported higher self-perceptions of AI literacy compared to their female counterparts (Table 1), which is reflected in the interview. Most male participants thought it was very convenient for both coursework and everyday life purposes, but were aware of the limitations of misinformation or disinformation provided by AI tools. Some also worried that over-reliance on AI tools may impede their learning, especially developing their ability in writing and translation (e.g., P1, P3, P4); some worried about ethical issues—P7 brought up issues regarding intellectual property; P2 mentioned he would revise wording based on AI-generated content. However, most who mentioned cross-checking explicitly expressed they used Google and/or official websites to verify information provided by the AI tools, even though the cross-checking process is "time-consuming" (e.g., P4, P8).

Participants also mentioned several aspects related to AI ethics, such as P7 pointed out his concerns about AI creation's copyright and intellectual property issues; P2 reported his efforts in revising AI-generated content to meet ethical standards. Moreover, P5 and P6 brought up privacy concerns when sharing personal information with AI tools. However, the scale used in this study emphasized learning aspects and did not include items addressing the ethical or privacy aspects of AI literacy. In our next step, we plan to incorporate relevant survey items to capture these important aspects. Given that AI services have been changing and evolving, the current study is an initial step to help us plan a longitudinal research tracing high school students' AI literacy and AI tool use behavior in order to help provide guidelines for a more comprehensive AI literacy in the high school curriculum.

GENERATIVE AI USE

We employed ChatGPT-4o for grammar checking and copy editing. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

First Author: project administration, conceptualization, methodology, data curation, formal analysis, writing – original draft, writing – review and editing; Second Author: conceptualization, investigation, visualization, writing – original draft; Third Author: methodology, data curation, formal analysis, writing – original draft, writing – review and editing; Forth Author: resources, writing – original draft.

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Information Science Professional's Engagement in Developing Data Documentation Frameworks for Machine Learning

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ABSTRACT
As machine learning continues to expand across domains, the robust data documentation frameworks and practices have become increasingly important to facilitate transparency. While the development of metadata frameworks is a longstanding focus in the field of information science, little is known about how information science professionals contribute to data documentation framework in machine learning contexts. This study explores the current engagement of information science professionals in developing data documentation frameworks for ML models. We conducted a literature search in a systematic way with the assistance of a generative AI tool and analyzed the authors' professional backgrounds. Preliminary findings indicate that information science professionals play limited leadership roles in developing data documentation, more often contributing to supporting roles.

KEYWORDS
Data documentation, Metadata framework, Generative artificial intelligence, Authorship, Information Science

INTRODUCTION
While data plays a crucial role in the development, evaluation, and deployment of machine learning (ML) models, it is also the key component in ensuring the fairness, transparency in the models (Anik & Bunt, 2021; Holstein et al., 2019). Data documentation, as a document-creation process and a document itself that intends to describe the data-creation context, has been viewed as an approach to address this concern (Miceli et al., 2022; Rostamzadeh et al., 2022). This documentation practice has been advocated as a straightforward and practical intervention to offer insight into the decision-making process in ML studies, to enhance transparency in the data production process, and prompt critical reflections (Raji & Yang, 2019). Based on this vision, many frameworks have been developed to help guide a thorough, detail-oriented data documentation practice.

Similar to metadata schemas, data documentation frameworks are template-form documents that support documenting different aspects of data, from the composition and size of the dataset, data selection, version, and collection to data preparation and distribution (Königstorfer, 2024). Well-known frameworks include Datasheets for Datasets (Gebru et al., 2018), FactSheets (Arnold et al., 2019), Data Cards (Pushkarna et al., 2022), Data Statements (Bender & Friedman, 2018), and Data Nutrition Labels (Holland et al., 2018), serving as five seed articles in this study. Additionally, various fields and institutions develop their own data documentation framework to accommodate their specific needs either, by adapting existing frameworks or designing new ones (Rostamzadeh et al., 2022; Srinivasan et al., 2021).

Designing and maintaining robust and useful metadata schemas and their vocabularies are the main focuses in the information science field. Previous studies have argued that the existing archival knowledge, i.e., data management and curation, could be adapted to support the development of ML dataset(Bhardwaj et al., 2024; Jo & Gebru, 2020). However, the extent of information science professionals' engagement in this context is unclear. Based on this curiosity, this study aims to explore: *How have information science professionals been engaged in the development of data documentation frameworks in ML studies?* We hope this study can depict the status quo and raise awareness within the information science community, fostering greater engagement and stronger collaboration with domain experts in ML research.

METHODOLOGY
This study implemented a systematic way of reviewing related literature and identifying the profession of the article authors to explore the current engagement of information science professionals in data documentation framework development. Furthermore, inspired by the emergent discussion on using generative artificial intelligence (GAI) tools in literature review (Pablo et al., 2025), this study also selected Claude 3.7 Sonnet to assist in keyword brainstorming and citation screening between March and May 2025. While ChatGPT is the most commonly used GAI tool in literature reviews, relatively little scholarly attention has been given to exploring Claude's potential (Lieberum et al., 2025). Thus, this study seeks to broadly explore Claude's utility in literature review processes.

Two interdisciplinary (i.e., Scopus, Dimensions) and one domain-specific (i.e., ACM Digital Library) databases were selected as the search foundation. Moreover, an AI-powered publication search tool, Connected Papers, was also used to expand the relevant articles based on the five seed articles mentioned above. With the help of Claude, a

librarian and a course instructor, search terms were developed based on three main concepts: data documentation, data documentation framework, and ML studies. In total, 1076 articles were retrieved on March 4, 2025, and their metadata (e.g., title, abstract, author) was extracted from the databases.

During the title and abstract screening process, one author and Claude were first provided with the study's context, and they independently screened a subset of the search results (n=25) to refine the inclusion and exclusion criteria. After finalizing the criteria, two reviewers subsequently screened the rest of the search results. The articles would be included if they (1) provide a structured conceptual framework (e.g., checklist, template) for data documentation, which is designed for human users to implement; (2) mention the components of data documentation, even if they approach it from different aspects (e.g., framework creation, evaluation, application); and (3) were published in English. Articles were excluded if the author(s) claimed they are works in progress. At this stage, Claude was prompted to provide its decisions and the rationale behind them, and was required to reconfirm its response each time. After reaching a moderate agreement (inter-rater reliability: 0.413), two reviewers discussed the discrepancies and another author was included to resolve disagreements. Given the copyright restrictions, Claude was replaced by this second author during the full-text review process (n=57). Two authors reached substantial agreement (inter-rater reliability: 0.787), with disagreements resolved through multiple discussions. In the end, 44 articles were selected for analysis of the authors' professional backgrounds.

To identify whether the authors are information science professionals, authors' names, order of authorship, affiliations, and educational backgrounds were collected. While the first three entities were extracted from Dimensions database, educational details (e.g., degree majors) were manually collected through Internet searches, relying on the self-reported information from authors' LinkedIn or personal websites. In this study, information professionals are defined as those who have either completed at least one information-related degree or are employed by information-related institutions that have terms like "information," "library," or "archive" in their names.

PRELIMINARY FINDINGS

Based on the extracted metadata from the database, among 197 unique authors (n=245 before deduplication) in 44 articles, 121 (61.4%) are from academia, 75 (38.1%) from industry, and one from a combination of both. The educational backgrounds of 83.8% of authors (n=165) were identifiable, among them, 64.5% (n = 127) hold PhDs. Of these, 103 hold degrees in computer science and engineering-related fields (52.3%). However, information science professionals appear to have limited engagement in the development of data documentation frameworks, with only 10.2% (n=20) of authors having information science-related background, and only one of them being the first author. This may imply that information science professionals typically serve in assisting roles rather than as primary investigators in studies of data documentation framework development.

DISCUSSION AND FUTURE PLANS

With the aim to capture the current engagement of information science professionals in data documentation framework development, this study applied a systematic approach to searching existing literature and analyzing the authors' professions. Our preliminary findings show that information science professionals have limited engagement, suggesting a considerable collaboration opportunity in this area.

While this study is in its early stages, several limitations and further directions for analysis have been noted. Given the limited selection of search terms and databases, our study may not fully reflect the rapidly evolving landscape of data documentation frameworks. Further modification of the searching strategy might be needed. On the other hand, the efficacy of applying a GAI tool, Claude, as one of the reviewers in the citation screening process may need further examination. Further comparison with other GAI tools might yield deeper insights.

We acknowledge that identifying information science professionals solely based on institutional affiliations and degree titles containing information-related terms is limited, and whether this provides authors with foundational knowledge in metadata schema development or data management is unclear. Additionally, self-reported information we retrieved online was sometimes incomplete; for example, some profiles listed only the author's PhD degree. Though the authorship of information science professionals offers a surface-level view of engagement, it neither guarantees their engagement nor implies that such work would not have been possible without them. These led us to consider other identification rationales and apply approaches such as surveying or interviewing these professionals to better understand their backgrounds and the extent of engagement as potential next steps.

Looking ahead, we are planning to map out the evolution of data documentation frameworks across domains (e.g., healthcare, science) by classifying different aspects of their development, such as the creation of new frameworks, modification of components, or reformatting the layout of existing ones. We hope this will help us better understand how data documentation frameworks have been built on top of existing established ones and better track progress for greater transparency regarding responsible data practices.

DATA AVAILABILITY

The full list of search terms and selected articles is available at https://osf.io/79jdq/?view_only=91d95160bf534ce4845f7ac616a36121.

GENERATIVE AI USE

We employed Anthropics' Claude Sonnet 3.7 for the following purposes: search term brainstorming, citation screening, grammar, and citation format assistance. We evaluated the output by rigorously reviewing the content and discussing its efficacy and correctness in meetings. The authors assume full responsibility for the content of this submission.

AUTHOR ATTRIBUTION

Pao-Pei Huang: conceptualization, project administration, methodology, investigation, writing – original draft, writing – review & editing; Yu-Ju Yang: methodology; investigation; writing – original draft; writing – review & editing.

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The Sweet Spot of Realism: Optimizing Avatar Human-Likeness for Persuasive Impact in Anti-Scam PSAs

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ABSTRACT

Drawing on the Uncanny Valley theory, we conducted an online experiment to examine how avatars with varying human-likeness (i.e., real human, deepfake, human-like, and cartoon) affect homophily, message credibility, and concept understanding in anti-scam public service announcements (PSAs). Results showed that the human-like avatar was perceived as less homophilous but more credible. Additionally, the deepfake condition closely mirrored the outcomes of the real human condition, suggesting it may cross the Uncanny Valley. This research offers timely insights for the deployment of AI-generated avatars, particularly in guiding how to calibrate avatar realism.

KEYWORDS

Human-likeness, Uncanny Valley, Public Service Announcement, Deepfake Avatar, Generative AI

INTRODUCTION

Generative AI and deepfake technology have facilitated the creation of cost-effective, hyper-realistic media content. However, its widespread use in communication settings raises the concern of the uncanny valley effect, which posits that human acceptance of artificial agents does not increase steadily with realism. Rather, when artificial entities closely resemble humans but fall short of perfect mimicry, they may evoke feelings of eeriness and discomfort, potentially undermining communication effectiveness (Kätsyri et al., 2015; Mori et al., 2012).

While generative AI and deepfake tools offer promising potential for creating realistic avatars in public service announcements (PSAs), their prosocial use and how audiences perceive and respond to such representations remain underexplored (Lu & Chu, 2023). Recent research on avatar design presents mixed findings. Some studies suggest that greater human-likeness enhances trustworthiness (Baake et al., 2025), while others indicate that awareness of deepfake manipulation may reduce acceptance (Hameleers et al., 2024). These inconsistencies highlight the complexity of calibrating visual realism and the importance of revisiting the uncanny valley theory using cutting-edge avatar technologies. To address this gap, this study investigates how different levels of avatar human-likeness influence avatar evaluation, message evaluation, and cognitive outcomes in the context of anti-scam PSAs. Specifically, we ask: How do varying levels of avatar human-likeness (i.e., real human, deepfake, human-like, and cartoon) affect (a) perceived homophily, (b) message credibility, and (c) concept understanding in anti-scam PSAs?

METHODOLOGY

We conducted an online between-subjects experiment in which 178 participants were randomly assigned to one of four PSA conditions, each featuring an avatar with a different level of human-likeness: real human, deepfake, human-like, or cartoon (see Figure 1). After watching the assigned PSA, participants completed measures on perceived homophily, message credibility, concept understanding, and demographics. The sample consisted of 60.67% females, with an average age of 30.4 years. On a scale from 0 to 10, participants reported moderate prior experience with AI (M = 5.12, SD = 2.11). A small monetary incentive was provided for participation.

Figure 1 (A) Real Human, (B) Deepfake, (C) Human-like and (D) Cartoon

All PSAs were based on the same original live-action footage featuring a real human actor which delivered content on common scam types and recommended actions for scam prevention. Using AI tools such as HeyGen (https://www.heygen.com) and Runway (https://runwayml.com), the footage was modified to produce three additional versions of the presenter: a deepfake (hyper-realistic), a human-like avatar (CGI-stylized but less realistic), and a cartoon-style character. Avatar designs were informed by frameworks in avatar realism and the

Uncanny Valley theory (Miao et al., 2022; Mori et al., 2012). To ensure experimental control, all versions were standardized in terms of background, script content, voice, and pacing.

As mentioned, three primary outcomes were assessed: avatar evaluation, message credibility, and conceptual understanding. Homophily, or perceived similarity between the viewer and the presenter, was measured using a 16-item, 7-point Likert scale originally developed by Mccroskey et al. (1975). Message credibility refers to the perceived believability and trustworthiness of a message (So & Song, 2023), measured with 7-point semantic differential scales adopted from Appelman and Sundar (2016). Conceptual understanding was measured through multiple-choice questions based on PSA content. A cumulative score captured the accuracy of participants' comprehension of the scam concepts presented in the video, following the approach used by Moran et al. (2016).

FINDINGS

A one-way ANOVA confirmed successful manipulation of perceived human-likeness across conditions, $F(3, 142) = 22.45$, $p < .001$. Tukey's HSD showed that the Human-like avatar ($M_{diff} = -27.27$, $p < .001$) and the Cartoon avatar ($M_{diff} = -56.63$, $p < .001$) were perceived with significantly lower human-likeness than the Real Human. There was no significant difference between the Real Human and Deepfake conditions ($M_{diff} = -10.85$, $p = .22$), suggesting that participants did not reliably distinguish the deepfake from the real human in terms of perceived human-likeness. The manipulation was thus deemed to successfully produce intended gradations of human-likeness.

To answer the research questions, a series of ANCOVAs were conducted to examine the effect of avatar human-likeness on homophily, message credibility, and concept understanding, controlling for participants' prior attitudes toward AI. A significant main effect of human-likeness on homophily was found, $F(3, 173) = 4.45$, $p = .005$. Tukey's HSD post-hoc comparisons showed that participants in the Human-like condition reported significantly lower perceived homophily than those in the Real Human condition ($M_{diff} = 0.652$, $p = .008$). No other pairwise differences were significant. Next, a significant main effect on perceived credibility was found, $F(3, 173) = 3.05$, $p = .030$. The Human-like condition elicited higher perceived message credibility than the Cartoon condition ($M_{diff} = -0.775$, $p = .035$). There were no other significant results for pairwise comparison. Finally, no significant main effect of condition was found on concept understanding ($p > .05$), suggesting that avatar human-likeness did not significantly influence participants' ability to comprehend and recall the scam-related content in the PSA.

DISCUSSION AND CONCLUSION

Overall, our findings show that avatars perceived as either real (which includes high-quality deepfakes) or clearly stylized (i.e., cartoon) tended to elicit greater homophily. Interestingly, while human-like avatars (i.e., CGI-stylized) were rated lower in homophily, they were perceived as more credible than cartoons. This suggests that audiences may not automatically associate homophily with message credibility. Instead, users might apply a machine heuristic, referring to a cognitive shortcut whereby messages from obviously artificial agents are evaluated with lower expectations of intent or bias, potentially enhancing trustworthiness (Sundar & Kim, 2019).

Furthermore, the deepfake condition closely mirrored the outcomes observed in the real human condition across all measures. This supports the prosocial use of deepfake technology in public communication. As people today struggle to reliably distinguish deepfakes from real humans, they may still respond positively to them as towards a real human, even when aware of the avatar's artificial nature, suggesting a possible transcendence of the traditional uncanny valley. These findings align with recent studies that revisit the concept of the uncanny valley hypothesis. For instance, Seymour et al. (2021) found that highly realistic avatars can elicit greater trust and affinity than both caricatured and slightly off-real ones. Our findings therefore suggest that deepfake avatars may represent a "sweet spot" of realism, that are socially engaging without evoking discomfort. Lastly, the level of an avatar's human-likeness did not significantly influence content retention, indicating that cognitive outcomes such as understanding and recall may be less sensitive to visual anthropomorphism than affective responses like perceived homophily.

This study makes both theoretical and practical contributions to AI-human communication research. While prior research often focused on static images or scripted interactions, this study investigates how audiences respond to dynamic, AI-generated video avatars. As AI technologies evolve, it is vital to reassess the boundaries of the uncanny valley and their implications for content design and understanding. By demonstrating that certain AI-generated avatars can match the effectiveness of real human presenters without eliciting discomfort, this study illuminates the ambiguity in the understanding of the uncanny valley in contemporary media contexts. Practically, the findings offer timely insights for the strategic deployment of AI-generated avatars in public communication. Specifically, message designers can calibrate avatar human-likeness to balance both perceptions of homophily and message credibility.

Certain limitations should be addressed by future research. Our focus on human-likeness was about visual realism and there is a need to examine other dimensions of avatar design, such as emotional expressions and social cues. Additionally, the study focused on the anti-scam PSA context among young adults. Further research is needed to examine how avatar realism influences persuasive outcomes across broader topics and demographic groups.

GENERATIVE AI USE

We confirm that we did not use generative AI tools to author this submission.

AUTHOR ATTRIBUTION

Shilan Huang: conceptualization, methodology, formal analysis, writing – original draft; Dion Hoe-Lian Goh: supervision, funding acquisition, writing – review and editing; Chei Sian Lee: supervision, funding acquisition, writing – review and editing; Xuan Wei, Qingling Xie, and Siyuan Wang: data curation, project administration.

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A Qualitative Content Analysis: #PalliativeCare on TikTok

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ABSTRACT

Palliative care is a health service to patients and caregivers to improve quality of life when facing a terminal illness. In this work-in-progress paper, we analyzed secondary data, namely 46 TikToks thematizing palliative care, to gain initial insights into the creators and types of content in recent years. We developed a codebook based on inductive and deductive methods to conduct content analysis. Twenty-four TikToks were posted by healthcare professionals, while thirteen were created by patients. Six TikToks were created by caregivers and three TikToks were posted by news agencies. While content of TikToks varied, around 70% of 46 TikToks were categorized as *Personal Experience* shared by healthcare professionals, patients and caregivers. Additionally, our goal was to explore research potential concerning affective information behavior and the development of para-social and/or cyber social interactions and relationships triggered by highly vulnerable and/or emotionally charged content. Therefore, we manually collected and analyzed 20 user comments for each of the five TikToks selected out of the 46 TikToks. These TikTok users provided emotional support by expressing sympathy and offering prayers; they also asked questions.

KEYWORDS

palliative care; tiktok; qualitative analysis; content analysis; social media

INTRODUCTION

Palliative care "prevents and relieves suffering through the early identification, correct assessment and treatment of pain and other problems, whether physical, psychosocial or spiritual" (World Health Organization, 5th August 2020). Still, Liu et al. (2023) reported that around 64% of 1,390 participants never heard about palliative care. Apart from how palliative care is understood (Liu et al., 2023), information provided regarding palliative care is not just about facts such as treatments and pain medication. As Fourie (2010) notes, "[e]motional experiences are seldom expressed in terms of a need for information, e.g. dealing with fear, not knowing how to share needs with family and friends, not knowing whether it is good to cry in front of others or not."

Research on TikTok in the health domain has focused on evaluating the quality of health-related information and content across various medical topics (Kong et al., 2021; Jaime et al., 2023; Lukić & Petrović, 2023; Sun et al. 2023). However, palliative care remains nearly underexplored area on TikTok. Easwar et al. (2023) analyzed 146 TikToks that thematize palliative care and have been posted between January 2020 and March 2021. Sixty-nine TikToks related to personal experiences. Out of 146 TikToks, 55.5% were created by healthcare professionals and around 33% by patients. To gain recent initial insights into TikTok creators and types of content associated with the topic of palliative care, we analyzed secondary data by Ghosh et al. (2025) **(RQ1)**.

In a scoping review of studies from 2000 to 2012, Hamm et al. (2013) found that one of the primary motivators for social media use among patients and caregivers related to child health is peer-to-peer communication. Kirkpatrick and Lawrie (2024) surveyed 1,172 U.S. women aged 18-29. The findings highlight that TikTok was used as a health information source primarily for receiving advice from others with the same diagnosis, obtaining social support, and gaining a better understanding of one's own condition (Kirkpatrick & Lawrie, 2024). A key factor contributing to TikTok's relevance in, for example, mental health discourse "is the relatable, personal nature of the content, whether that is storytelling or sharing advice" (Milton et al., 2023, p. 13). This emotional authenticity can create a sense of intimacy and connection, potentially leading to development of para-social interactions (PSI), originally coined by Horton and Wohl (1956), or even para-social relationships (PSR; one-sided relationships) between viewers and content creators. Stock et al. (2022) refer to cyber-social interactions and relationships, when observing this phenomenon on live streaming services. We aim to explore the extent to which PSI/PSR or cyber-social interactions and relationships emerge within these online communities in the context of palliative care **(RQ2a)**. Further, this analysis offers first insights into how users interact with TikTok creators, focusing on emotional tone (sentiment) and relational dynamics of these interactions through comments **(RQ2b)** to explore the research potential of affective information behavior (e.g., Nahl & Bilal, 2007; Chen, 2021).

METHODS

To answer RQ1, we deductively used the categories by Easwar et al. (2023). We modified and extended the categories through inductive analysis. We applied our codebook on the secondary data provided by Ghosh et al.

(2025). Among others, they selected the hashtag #palliativecare and selected the top 74 TikToks from 20.3K posts on TikTok using a URL pattern. They removed duplicates, which resulted in remaining 68 TikToks tagged with #palliativecare. We defined several inclusion and exclusion criteria (e.g., "Other languages than German and English") and applied these criteria to the 68 TikToks. In total, 46 TikToks met these criteria and were used for further analysis. We approached the analysis of the data with care, by refraining from provision of examples that could identify users directly. The authors independently coded the videos. Interrater reliability for each category (Cohen's κ) and for the codebook (κ_{pooled} and κ_{ave} (De Vries et al., 2008)) was calculated. The third, final round of coding yield a κ_{pooled} of 1 and a κ_{ave} of .958.

To explore RQ2a and RQ2b, we selected five out of the 46 TikToks in our sample and reviewed a subset of 20 comments per each video. The selected TikToks were published by healthcare professionals, patients, caregivers and news agencies.

While the following section provides initial insights, the poster will outline a more comprehensive overview of these findings to invite participants to critically discuss the practical and theoretical implications of affective information behavior and PSI/PSR or cyber-social interactions and relationships at the ASIS&T Annual Meeting 2025.

RESULTS (WORK-IN-PROGRESS)

Around 46% of 46 TikToks were uploaded in 2024, 26% in 2025 (cutoff date March 2025), and 17% in 2023. Twenty-four TikToks were posted by healthcare professionals and 28% of 46 TikToks were created by patients. Six TikToks were created by caregivers and three TikToks were posted by news agencies. **RQ1:** Around 70% of the 46 TikToks are categorized as a *Personal Experience* (including patients, healthcare professionals or caregivers). Some users try to show and explain the benefits of receiving palliative care, such as better medication and pain management. There are also TikToks in which patients describe desperate situations or instances where they will not get further treatment. Around 44% of 46 TikToks are assigned to the category *Community*, which includes subcategories such as *Relationship/Belonging* (19.56% of 46 TikToks), *Answering Questions* (13.04% of 46 TikToks) and *Encouragement* (around 9% of 46 TikToks). Five TikToks included the names of the loved ones who get or got palliative care. Around 33% of the 46 TikToks showed patients or healthcare professionals interacting with or connected to medical equipment (*Medical Equipment*). Patients were shown with medical tubes or lying in hospital beds while, e.g., sharing that they had been informed that they were dying or responding to questions asked by TikTok users. **RQ2a&b:** The comments made by other TikTok users on a TikTok video assigned to the category *Education* (posted by a nurse) tended to reflect a mix of personal and professional engagement. Most of the 20 comments fell into the categories of personal experience, professional input, follow-up questions, and expression of appreciation, which indicates that users actively related the content to their own lives and searched for further clarification. The TikTok creator liked and replied to some of the comments. The TikTok with negative tone (category *Personal Experience*) got tendentially comments with emotional support. Most responses expressed encouragement, sympathy, prayer, and questions related to palliative care, with a generally neutral or positive tone. A TikTok assigned to *Personal Experience* with a positive tone (created by mother as a caregiver of a small child), got tendentially comments that had clearly a positive tone and expressed compliments, appreciation, and encouragement. A small number of comments included questions, both generally and personally motivated, and occasional reflections on palliative care, indicating emotional support and light informational curiosity. Considering a goodbye message of one TikTok creator, user comments were emotionally charged and reflected a mix of farewell, appreciation, and spiritual or moral response. While some comments expressed support, remembrance, or professional understanding, many reflected religious perspective and emotional bargaining, with repeated pleas to reconsider the decision, which highlights the sensitive and controversial nature of this topic as well as personal interest in the creator, which could indicate the development of a PSR of the commentators towards the creator. A TikTok posted by a news agency which was coded as critical was about a newly introduced law in the UK on assisted dying. The comment section reflected polarized discussion, with users expressing supporting and opposing views. Comments included ethical concerns, personal experiences, comparisons to other countries, some responses took a dismissive tone, suggesting that the individuals could just "do it" themselves.

DISCUSSION

We aimed to shed light on TikToks thematizing palliative care, a topic that is emotionally charged and shows personal experiences of patients, caregivers and healthcare professionals. The small sample size limits the generalizability of the findings; hence, they should be interpreted as preliminary and exploratory. Although the sample consists of 46 TikToks published between 2020-2025, the types of creators and the major content category seem to be similar to Easwar et al. (2023) (RQ1). This could lead to the assumption that the characteristics of the health communication around palliative care on TikTok remained similar over the years. We provided first insights into a small sample of comments to better understand the PSI/PSR and cyber-social interactions and relationships as well as affective information behavior (RQ2a&b). Content on palliative care can be very personal and intimate (e.g., medical equipment and illnesses, final goodbyes). Watching these personal TikToks and seeing how people say

goodbye and share their fears make the researchers part of this community and enables to “deepen our understanding of ‘lived experiences’ through the eyes, heart and voices of the people.” (Fourie, 2012).

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to analyze the data and write this submission.

AUTHOR ATTRIBUTION

First Author: Project administration; conceptualization, methodology, data curation, formal analysis, writing – original draft; Second Author: data curation, formal analysis, writing – original draft, review and editing;

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Disrupting Informed Consent: Refusal and Cultural Sovereignty in Indigenous Knowledge Practices

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ABSTRACT
Informed consent is an ethical and legal principle in research determined at the national level, resulting in differentiated levels of compliance across countries. Therefore, what are the implications for Indigenous communities, where collective consent and relational ethics matter most (Smith, 2012)? This poster explores refusal as a generative Indigenous methodological and ethical stance to develop a library and information science (LIS) framework for honoring refusal as a sovereign act of care and knowledge protection. Through an examination of two cases: Amos Bad Heart Bull's ledger drawings and the isiXhosa initiation ceremony of *Ulwaluko*, we argue that refusal is an active form of cultural governance that determines what knowledge may be shared, by whom, and under what conditions (Simpson, 2007). Drawing on the work of Simpson (2007), Smith (2012), Tuck & Yang (2014), Gasa (2007), Hlabangane (2021), Cifor et al. (2019), and Zong & Matias (2024), this poster interrogates authorship vs. cultural ownership, positionality, the role of land and culture as ceremonial actor, and other aspects of cultural sovereignty. It invites the audience to disrupt their notion of informed consent and to engage in a critical conversation of refusal in LIS research.

KEYWORDS
Informed consent; Refusal; Cultural sovereignty; Indigenous research ethics; Knowledge governance

INTRODUCTION
As researchers in the United States (US), Canada and South Africa, we are familiar with informed consent in research and why it came about. Institutional Review Boards (IRBs) in the US, and similar bodies in other countries, review the informed consent taking place in research. They ensure that an ethical process is applied that includes providing participants clear and accurate information about a study, allowing them to make an informed decision about their participation. Researchers should ensure participants know what the study's purpose, procedures, potential risks and benefits, and their rights to participate as well as withdraw at any time. They should consider in the design process the participants' ability to participate due to age, cognitive capacity and linguistic fluency, and to address them, as appropriate. The legal requirements and associated procedures are determined at the national level, resulting in differentiated levels of compliance across countries. While there is an understanding of implications based on demographic criteria, issues related to cultural or community practices are left to researchers to raise, who like IRB members, often preclude individuals with the relevant expertise to enforce cultural or community protocols.

Refusal in informed consent in traditional research is considered at the individual or at the household level, however, this has to be problematized in contexts where collective consent and relational ethics matter most (Smith, 2012), such as in Indigenous communities. Moving beyond refusal as declining, opting-out, or withdrawing from research, this poster explores refusal as a generative Indigenous methodological and ethical stance, grounded in sovereignty, care, and accountability (Tuck & Yang, 2014). Thus, refusal here is understood not as disengagement but as a form of political and intellectual sovereignty (Simpson, 2014). Moreover, this poster interrogates authorship vs. cultural ownership, positionality, and the role of land and culture as ceremonial actors, and collective and cultural forms of authority.

DISRUPTING INFORMED CONSENT: TWO INDIGENOUS CASE STUDIES
To explore and understand how refusal operates as a form of cultural sovereignty, this poster turns to two thematically resonant examples of indigenous communities in the United States and South Africa. Through this comparative lens, we illustrate how visual and embodied forms of Indigenous knowledge, whether inscribed on paper or lived through ceremony, are governed by protocols of protection that challenge dominant research paradigms. Each case invites us to consider how refusal functions as an ethical stance, a mode of storytelling, and a strategy of cultural survival, as well as illustrates the challenges around authorship vs. cultural ownership.

Case Study One: The Ledger of Amos Bad Heart Bull
Amos Bad Heart Bull (1869–1913), an Oglala Lakota (Sioux) historian and artist, created a pictographic ledger of over 400 drawings that offers a profound visual archive of Lakota life and sovereignty in the early 20th century, annotated in Lakota and English. Though never intended for public display, the ledger was preserved by his sister, Dollie Pretty Cloud, who safeguarded its sacred significance. In the 1930s, anthropologist Helen H. Blish with Pretty Cloud's consent, borrowed the ledger for her research, photographing the images and working with Lakota elders to produce interpretive notes, which later were used to publish *A Pictographic History of the Oglala Sioux*

(Blish, 1967). Though Pretty Cloud initially collaborated with Blish, in 1947, she chose to be buried with the ledger in a final act of cultural protection. This decision of refusal is not a loss, but an assertion of sovereignty, love enacted as protection, silence as boundary, kinship as resistance. That is, refusal can coexist with conditional sharing, whereby her decision to grant limited access reflects a relational, carefully negotiated form of sharing rather than open release. It attests to the complexities of cultural governance over knowledge sharing that community members have to traverse.

Case Study Two: The Wound and Ulwaluko in isiXhosa Culture

The Wound (2017), directed by John Trengove, dramatizes *Ulwaluko*, the sacred isiXhosa initiation ritual marking boys transitioning into manhood. The film explores tensions between tradition and modernity, secrecy and visibility, masculinity and queerness.

Though internationally acclaimed, it faced intense backlash within South Africa, especially from isiXhosa communities in the Eastern Cape, which did not allow it to be screened. Traditional leaders and community members viewed the film not as controversial for its queer themes, but as a violation of sacred boundaries by a white, non-Xhosa filmmaker. This spatial and cultural rejection constitutes a form of refusal: a collective assertion of sovereignty over ceremonial knowledge. Protests, legal challenges, and the film's adult-content classification should not be construed as censorship, but demands for consent and protection by the isiXhosa communities. Their stance affirmed that some knowledge, particularly rooted in ceremony, must remain shielded from public visibility.

DEVELOPING AN LIS FRAMEWORK FOR HONORING REFUSAL

This poster takes an Indigenous research ethics approach rooted in ethnographic refusal, relational accountability, and feminist reflexivity to reconsider refusal. It engages ethnographic reflection situating the authors in our distinct yet intersecting positionalities. As a Xhosa woman, one of us writes not as an outsider to the isiXhosa ceremonial world, but neither as an initiated man. The second author, a Peruvian-born Chinese-Canadian American woman, is deemed the Other but claims her position as a twice minority. These in-between positions complicate authority and call for care. Simultaneously, we are both embedded within a Western academic institution that often prioritizes extraction and legibility over relational ethics.

These tensions shape our intersecting approach to examine interdisciplinary approaches to refusal in order to develop a framework for LIS research and data collection and management that honors refusal and pushes the boundaries of informed consent: to listen for silence, to acknowledge when we are not situated to speak, and to respect knowledge held in trust by communities. These include Feminist Data Manifest-No (Cifor et al, 2019), which emphasizes new data futures (i.e., better ways of collecting data that reduces harm), and refusal as design by Zong & Matias (2024) who state "refusal is a practice of saying "no" to how data are collected or used, and rejecting the processes, goals, or authority of data collectors." Together, we navigate the ethics of relational and situated epistemologies and query: Who gets to tell these stories, and under what terms? What does it mean to write about a ceremony not meant to be spoken of by women or in academic contexts? What responsibilities do researchers carry when navigating sacred, embodied, and intentionally withheld knowledge? How do researchers and communities co-design research?

CONCLUSION: DISRUPTING AND ENGAGING WITH INFORMED CONSENT

This poster invites the audience to critically reimagine informed consent not as a checkbox, but as a practice accountable to the relational, spiritual, and ceremonial frameworks that govern Indigenous knowledge, and collective and cultural forms of authority. It calls on researchers, especially within library and information science, to confront the limits of access-driven paradigms and to be able to sit with the discomfort that refusal brings.

Refusal is not an obstacle to research, rather, it is an ethical, sovereign response to a long history of extractive inquiry. To honor it is to shift from entitlement to humility, and from extraction to relationship. This is not a call to disengage but to engage differently; to listen carefully, to respect the silences, and to co-create spaces of research that value trust, reciprocity, and consent as defined by the community, not the academy.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Vuyo Jamieson: conceptualization, investigation, methodology, project administration, writing – original draft, writing – review and editing. Clara M. Chu: conceptualization, investigation, methodology, project administration, writing – original draft, writing – review and editing.

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Copy, Paste, Innovate: Leveraging Sentiment Analysis and Interviews to Uncover AIGC Literacy among China's Youth

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ABSTRACT
The rapid adoption of AI-generated content (AIGC) tools among China's youth highlights a critical gap in understanding the literacy required to navigate this technological revolution. While existing research emphasizes technical and industrial implications, few studies address the multidimensional literacy frameworks needed for responsible AIGC engagement. This study investigates AIGC literacy by combining sentiment analysis of 4,000 Zhihu comments with semi-structured interviews involving 30 young participants. The approach reveals significant sentiment variations across topics, urban hierarchies, and tool releases, offering a layered view of how public perceptions evolve in response to contextual and technological shifts. Meanwhile, qualitative data uncover key literacy dimensions, including technical proficiency, ethical awareness, and critical thinking. Findings indicate a nuanced sentiment landscape: 50.7% neutral, 27.3% positive, and 22.0% negative, with urban development and tool launches significantly influencing perceptions. The study contributes a foundational framework for measuring AIGC literacy, bridging theoretical and practical gaps. Implications extend to policymakers and educators, offering insights to design targeted interventions that foster responsible AIGC use among digitally native populations. By integrating empirical data with qualitative depth, this research advances global discourse on AI literacy in diverse sociocultural contexts.

KEYWORDS
AIGC Literacy, China's Youth, Social Media, Sentiment Analysis, Interview

INTRODUCTION
Recently, the launch of DeepSeek has caused a huge stir in China, becoming a hot topic across Chinese social media and dominating trending discussions. In the past several years, amid the explosion of various AIGC tools, China's youth have emerged as the largest group of users and consumers, fueling the rapid growth of this AI-driven revolution (Shin, 2023; Floridi et al., 2018). Research highlights the importance of both technical and cognitive skills, including the ability to evaluate the credibility and biases inherent in AI-generated content (O'Neil, 2016; Binns, 2018). While the literature has primarily focused on the technical and industrial impli- cations of AIGC, less attention has been paid to the literacy frameworks necessary for broader societal engagement with AI (Kerr, 2022). This gap is particularly evident in the context of younger populations, who are early adopters and primary consumers of AIGC.

China, with its robust AI industry and vast online user base, offers a unique setting for studying AIGC literacy. Recent surveys indicate that China is not only a major player in AI development but also home to a highly digitally literate youth demographic (Chen, 2020). Furthermore, plat- forms like Zhihu,where young, educated individuals engage in knowledge-sharing and discus- sion, offer an ideal environment to explore how AIGC literacy develops in the context of public discourse. Zhihu's focus on in-depth discussions enables us to analyze how users engage with, interpret, and critique AIGC (Wang Li, 2022) which is an ideal platform for exploring the AIGC literacy of Chinese young people. Here are the following research questions proposed:

RQ1: Explore the comments on the hot posts about AIGC on the Zhihu platform.

RQ2: Develop an indicator system based on the findings to measure AIGC literacy across different contexts.

METHODS
I recruited 30 individuals aged 18 to 30 who currently reside in 10 cities. Among them, there are those who haven't completed their undergraduate studies, those who are undergraduates, those who are postgraduate students, and young people who have already started working. Among them, 40 percent of them are in stable romantic relationships. I conducted 40-60 minute semi- structured interviews with each of them. To supplement the qualitative data, web scraping will be employed to collect public sentiment from Zhihu. This study crawled the comments (with more than 500 likes) under the topics that had high discussion degrees on Zhihu platform as of February 23, 2025. We chose the Chinese API, Tongyi Qianwan, to analyze nearly 4,000 comments and achieved good results.

PRELIMINARY FINDINGS

Diverse Sentiment Landscape across AIGC Topics

In Figure 1, the overall sentiment analysis presents a nuanced picture of public perception to- wards AIGC. With neutral sentiment claiming a 50.7% share, it reflects a state of ambivalence among users, likely stemming from the novelty and complexity of AIGC technologies. Many might be in the process of grappling with its implications, neither fully embracing nor rejecting it. The 27.3% positive sentiment showcases optimism, perhaps driven by the potential bene- fits AIGC offers in various fields like journalism and manufacturing. Conversely, the 22.0% negative sentiment cannot be ignored. When examining sentiments by topic, for AIGC Tools, the 21.8% negative sentiment alongside 27.6% positive indicates a polarized view. This could be attributed to the practical challenges users encounter, such as tool - specific limitations, usability issues, or concerns about the quality of AI - generated content.

Theme	Count	frequency
Technology Advancement	1894	58.89%
Social Impact	589	18.31%
Academic Research	239	7.43%
Technology Limitations	145	4.51%
Education	100	3.11%
Ethics	54	1.68%
Political Backround	51	1.59%
Law and Regulation	49	1.52%
Privacy and Security	38	1.18%
Economics Problems	25	0.78%
Indicidual Development	23	0.72%
Health Problems	9	0.28%

Figure 1. Themes of Comments on Zhihu (left)

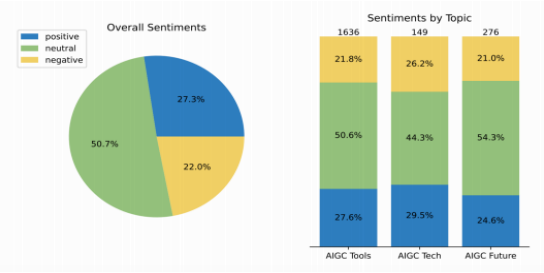
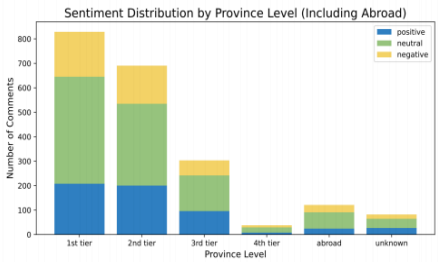


Figure 2. Sentiments among different sections (right)

Urban Hierarchy Influences AIGC Sentiment

The sentiment distribution across different province levels reveals a strong correlation with ur- ban development. As we can see in Figure 3, first - tier cities, with a high volume of comments, exhibit a relatively balanced mix of negative, neutral, and positive sentiments. This can be ex- plained by the fact that these cities are technology hubs, housing a diverse population including tech enthusiasts, early adopters, and professionals from various fields. Thus, urban hierarchy plays a crucial role in shaping the sentiment and level of discussion around AIGC.



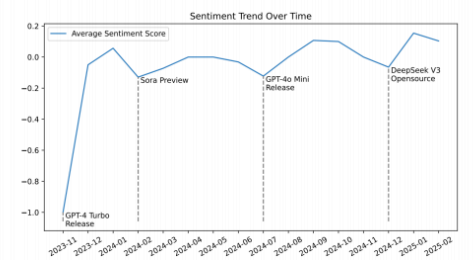


Figure 3. Sentiment Distribution by Province Level (left) Figure 4. Sentiment Trend Over Time (right)

New Tool Releases as Sentiment Catalysts

The sentiment trend over time demonstrates a clear link between new AIGC tool releases and public sentiment (Figure 4). The launch of tools like DeepSeekV3 open source coincides with an upward shift in the average sentiment score. This suggests that innovative and well-received tool releases can significantly enhance public perception, perhaps by introducing new capa- bilities, improving user experience, or expanding the application scope of AIGC. Conversely, events such as the Sora Preview and GPT-4o Mini Release are associated with more subdued or negative sentiment movements. This could be a result of unmet expectations, concerns about the technology's reliability, or ethical and privacy issues that surface during the intro- duction of these new tools.

CONCLUSION

This study sheds light on the evolving landscape of AIGC literacy among Chinese youth, revealing how public sentiment and individual competencies coalesce around emerging AI technologies. By integrating large-scale sentiment analysis with in-depth interviews, the research identifies key dimensions of AIGC literacy—technical proficiency, ethical awareness, and critical thinking—while highlighting how urban context and technological milestones influence public perceptions. The findings underscore the need for a multidimensional framework to assess and foster AIGC literacy in a rapidly changing digital environment. As AI-generated content becomes increasingly pervasive, these insights offer timely guidance for educators, policymakers, and platform designers seeking to cultivate informed and responsible AIGC users in China and beyond.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Boyuan Jia: conceptualization, methodology, data curation, formal analysis, writing – original draft, writing – review and editing; Pu Yan: project administration, supervision, writing – review and editing; Yicheng Liu: methodology, data curation, formal analysis, writing – review and editing.

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Existing Cues Fail: A Mixed-Method Study on the Identification of Virtual Influencers

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ABSTRACT
This study investigates users' identification of virtual influencers in social media. A mixed-method study consisting of an eye-tracking experiment and an interview with 60 participants was conducted. The results show that users can identify VIs with moderate accuracy. Users have relatively comprehensive but insufficient identification criteria and complex attitudes toward VIs. These findings suggest implications for AI literacy education.

KEYWORDS
Virtual influencer; Social media; Identification cues; Attitude

INTRODUCTION
With the proliferation of artificial intelligence (AI), AI-generated content has been widely applied in content creation. In terms of visual presentation specifically, virtual influencers (VIs), the virtual human-like characters in social media, have also been practically used in attracting audiences for content and product consumption (Stein et al., 2024; Xiang & Fu, 2024). The contradictory phenomenon that VIs can not actually use products or express their own opinions but still exert significant influence on consumption has sparked widespread academic interest in issues (Li & Chen, 2024), such as the impact of technology on society (Arsenyan & Mirowska, 2021), the boundary between reality and virtuality (Potdevin et al., 2020), and content ownership and ethics (Richards et al., 2023).

While the presentation modality of VIs varies according to the platforms, including static images and dynamic videos (Stein et al., 2024), this study focused on images. Existing studies have explored VIs' influence on brands (De Cicco et al., 2024) and users' emotional responses (Li & Chen, 2024) and interaction (Stein et al., 2024), assuming that users implicitly recognize the "virtual identity" of VIs or setting clear distinctions between groups (Boissieu & Baudier, 2023). However, whether users can accurately identify VIs and how users detect VIs have not been sufficiently researched. This study explores users' identification accuracy and heuristics of VIs in social media. The research question focuses on "**How do users identify VIs in social media?**"

METHODOLOGY
This study employed a mixed-method design combining an eye-tracking experiment and a post-experiment interview. Before the experiment, a pre-test questionnaire was used to collect participants' demographic information, explain the procedure and acquire informed consent. Then each participant went through an eye-tracking calibration before starting the experiment. During the experiment, 36 profiles (18 of real human influencers and 18 of VIs) and corresponding graphic posts were shown to the participants. The resolution of images was standardized to 1080 * 960 pixels. Participants had to rate the authenticity on a 5-point scale ("1" means very low, "5" means very high). To replicate a genuine browsing scenario more accurately, there was no time constraint during the experiment (Fell & Bruza, 2022). After the experiment, a semi-structured interview was conducted with each participant, including the basis of identification, personal experience and feelings about VIs, and the influence of VIs on promotion. The research procedure is shown in Figure 1.

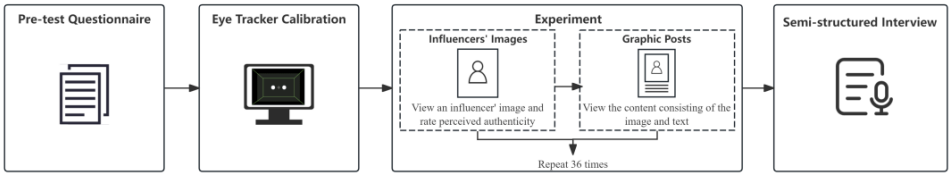

Figure 1. Research Procedure

Tobii Pro Fusion eye tracker (250 Hz) was used to record participants' eye movements, including gaze duration and scan path. The perceived authenticity was recorded through researcher-assisted recording. Images were segmented into background, face, hand, clothes, and hair AOIs (Figure 2).

Participants were recruited through social media, comprising 30 males and 30 females, ranging from 18 to 38 in age (Mean=28.32, SD=3.186). Most participants were students (78.3%), followed by technology developers (11.7%). Each participant signed an informed consent and received a reward of 60 RMB.

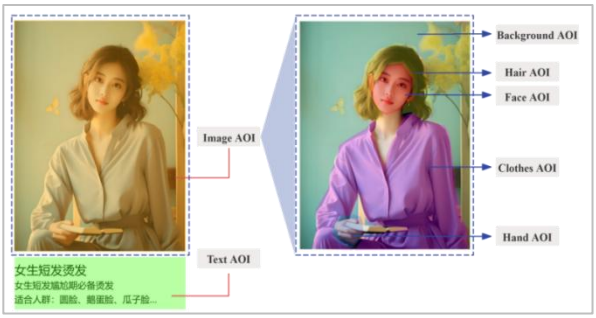

Figure 2. Example of AOI Segmentation

Figure 3. Heat Map for an Influencer

RESULTS

Users rely on various visual clues to detect VIs. There are mainly four main heuristic cues: (1) **skin and clothes texture**: texture and flow of skin and clothes; (2) **body proportions**: the proportion of characters' limbs, especially in hands; (3) **facial features**: proportions and special facial memory points; (4) **image structure**: professional basis, such as saturation, light and blur. Among these, skin and clothes texture is the most commonly used basis for identification. As one participant commented, "*if the skin is particularly bright, smooth, and pore-free, it is clearly a VI.*" Image structure is relatively less referred and infrequently mentioned in previous studies. Some students and practitioners of AI or art are familiar with this,"*VIs are essentially on the basis of biological framework rather than a physical simulation, so lighting and some details may be inaccurate.*" Based on the result, this clue provides participants with a relatively accurate basis.Based on the results, this clue offers users a relatively accurate foundation. The interview shows that users actively interpret diverse visual cues in their attempt to discern VIs. In terms of users' focus, Figure 3 shows an example of the fixations. There were significant differences in gaze duration across different regions ($H(4) = 6{,}004.911$, $p < 0.001$). The primary focus was on the face AOI, with the average gaze duration of 1,844.4 ms.

Despite engaging with multiple cues**, users made inaccurate judgments.** The overall identification accuracy for all images is relatively low (59.3%). Considering the gender of influencers, the accuracy is 55% for male VIs and 61.7% for female VIs. Participants were unable to differentiate between human influencers and VIs for about 17.8%. Most participants were not confident in their identification, with self-reporting certainty for roughly 50-70%. The narrative cues could either mislead users' identification.For example, one participant remarked, "*VIs are usually refined and delicate. If the scene is life-oriented, it is difficult to tell the difference.*" This suggests that identity recognition is influenced by both perceived rationality and technical realism.

Interestingly, users' attitude and engagement with influencers are not necessarily tied to the perceived authenticity. Some users are willing to appropriately interact with VIs for aesthetic and entertainment value.

CONCLUSION AND DISCUSSION

Users can identify VIs with moderate accuracy. Although users have relatively comprehensive identification heuristics, the VIs generated by AI technology in social media are difficult to accurately identify based on the human figures alone. Professional content, such as image structure, can provide users with more accurate reference, so AI literacy can be further adjusted to respond to this challenge. For example, it may be useful to popularize the logic behind image generation technology and the color and structure characteristics of the images.

There are some limitations of the research. First, the images used in this experiment are of the same race, thus, these findings may not apply to other cultural contexts. Second, the images of influencers were collected from different platforms and may vary in style. Future research could further explore how these perceptions vary across different usage contexts to offer a more nuanced perspective on the role of VIs.

GENERATIVE AI USE

We employed Grammarly to polish the paper. We reviewed and modified the output with careful consideration. The authors take full responsibility for the content of this submission.

AUTHOR ATTRIBUTION

Jin Fan: conceptualization, formal analysis, investigation, methodology, visualization, writing – original draft; Zhang Pengyi: methodology, project administration, supervision, writing – review and editing.

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Exploring IB/ IP ff Emerging Adults on Health in the Age of Generative AI through a Cognitive Authority Lens

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ABSTRACT
The PEW Research reports that after the COVID pandemic around 37% of teens have mental health issues (Schaeffer, 2025) and almost 50% of teens attribute this to social media (Park, 2025). Initial explorations among emerging adults (Hochberg & Konner, 2020) have shown that even though social media apps are still the primary choice of information source, the use of generative AI is on the rise (Rainie, 2023). However, it is not yet clear how emerging adults between the ages of 18 and 24 evaluate information and determine credibility and trustworthiness of health information sources that are based on artificial intelligence (AI). This project is a work in progress and intends to explore the information behavior and practices of emerging adults in New Jersey who use generative AI for health information. Using data obtained from observation-based interviews (Lindhof & Taylor, 2019; Lareau, 2021) of selected participants, I shall use selective coding (Charmaz, 2014) to examine how concepts of cognitive authority can help to inform information behavior and practices of emerging adults. This research is conducted through a cognitive authority lens (Wilson, 1983; Rieh & Belkin, 1998) with the hope that an understanding of the relationships between emerging adults and health information sources may provide insights into better strategies to provide access to trustworthy and credible health information.

KEYWORDS
Cognitive authority, Emerging adults, Generative AI, Health

INTRODUCTION
In literature, the seminal work on cognitive authority comes from Wilson (1983). Cognitive authority is a constructivist approach that determines the dependability of information obtained from a source based on the level of credibility of the person or organization around a certain topic. Belkin and Rieh (1998) take a social constructivist approach to extend the concept of cognitive authority to a volatile and dynamic information source like a web-based system. In addition to cognitive authority, the model iteratively evaluates the quality of information based on user contexts and that task at hand (Rieh, 2002). This judgment model provides important insight into how trust and credibility of information sources are evaluated based on evaluation of quality of information and perceived authority of information sources.

Studies have shown that other trusted humans are the preferred source of information among urban teenagers (Agosto & Hughes-Hassel, 2006). However, in the age of generative AI, especially after the COVID pandemic, it is essential to understand how this trust is translated to other information sources. A study on young Finnish men found that everyday health information literacy correlates positively to health-promoting behaviors (Hirvonen, et al., 2016). This has important implications for the necessity of understanding health information needs and providing access to accurate and appropriate health information to emerging adults.

One strategy is to understand how emerging adults navigate cognitive authority on information sources online and how that can inform system designers and information providers make health information accessible to emerging adults.

METHODS
Data collection
The data collection phase is divided into two phases. The first phase will determine the eligibility of interview candidates. The criteria will be based on elements of everyday health information literacy (Hirvonen, 2016) such that the participants have health information needs that are satisfied from online information sources and are able to demonstrate at least three open-ended tasks (Lareau, 2021) related to health information needs. The second phase is the actual data collection using observation-based interviews (Lindhof & Taylor, 2019).

Analysis
Analysis of data will initially comprise of open coding and axial coding. Then selective coding will be used to extract relations and categories. The categories and relations thus obtained will be analyzed considering existing concepts of cognitive authority and their evolution. The objective is to explore factors that influence cognitive authority of the emerging adults on generative AI.

Conceptual Framework

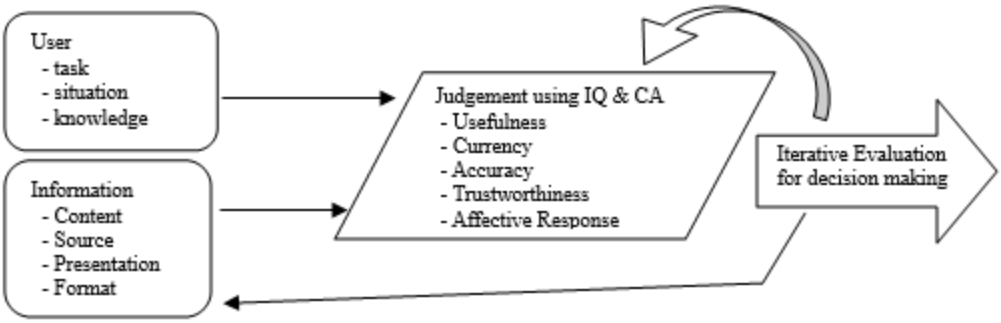

Figure 1. Adaptation of Rieh's (2022) judgement model

The interviews are based on the iterative evaluation of information quality (IQ) and cognitive authority (Rieh, 2002). Users' context and information dimensions are continually evaluated to determine IQ and CA based on usefulness, currency of information, accuracy, trustworthiness and affective response of individual as shown in Figure 1. Users' context is the task at hand, environmental factors inform the situation, and knowledge includes firsthand knowledge of the individual as well as the perceived cognitive authority of various information sources. Similarly, dimensions of information include the content, source, presentation and format.

EXPECTED RESULTS

Research Questions

RQ1: How do the emerging adults evaluate information from generative AI technology as compared to traditional information sources like Google when searching for health information?

RQ2: What factors are important to the emerging adults in evaluating the credibility/ trustworthiness/ competency of health information obtained from generative AI or Google?

RQ3: How do emerging adults decide when to use generative AI to seek health information?

RQ4: How does the concept of cognitive authority (Wilson, 1983) help us to understand the information seeking behavior of the Generation-Z population regarding AI technology?

Theoretical and Practical Significance

A comparison of constructivist and constructionist approaches to cognitive authority suggests that constructionist approach can better accommodate social and contextual aspects of cognitive authority in contrast to an individual's notion of cognitive authority (McKenzie, 2003; Hirvonen et al., 2025). An understanding of the evolution of concepts of cognitive authority from cognitive mental models to social constructivist models, and then to social constructionist models is crucial in empowering emerging adults and generative AI application toward a mutually beneficial relationship.

Healthcare is one of the premier adopters of generative AI for services ranging from pre-clinical research, clinical trials, diagnostics and patient care (Sallam, 2023). Despite the challenges of putting AI technologies into practice (Rebitzer & Rebitzer, 2023), Natural Language Processing (NLP) applications are making significant. There are indications of both decreasing trust and increasing potential in AI technologies (Rainie, 2018; 2023). A striking 79% of US adults did not want to use AI chatbot to support their mental health, but 65% said they would want AI to be used for skin cancer screening (Funk, 2023). Understanding the factors that affect trust and how they influence cognitive authority of emerging adults regarding generative AI for health information will inform all stakeholders of AI technologies --users, developers, policy makers as well as investors-- build systems that are more beneficial than harmful, which is the ultimate challenge.

ACKNOWLEDGMENTS

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AUTHOR ATTRIBUTION

Saubhagya Joshi: conceptualization, investigation, methodology, validation, visualization, writing – original draft, and writing – review and editing. SM Mehedi Zaman: writing – review and comments

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

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Empowering Children's Maker-Based STEM Learning through Generative AI in Public Libraries

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ABSTRACT

This paper presents a pilot study on integrating the use of Generative AI (GenAI) into maker-based STEM learning through playful activities for children (aged 6-12) and their families in libraries. Our preliminary analysis of log data from an LLM-enabled chat system and video recordings shows how children and their caregivers used GenAI for various purposes, such as seeking assistance when encountering challenges, through which they could also learn about how to formulate prompts for GenAI. We also found some limitations of the LLM-enabled chat system in providing situated feedback during maker-based learning. Our study speaks to the conference theme, *the Role of IS in the age of Human-Centered AI*, by shedding light on the potential of hands-on activities based on designing and making for children's AI literacy as well as problem-solving, creative thinking, and prompt engineering skills.

KEYWORDS

STEM learning; children's learning; AI literacy; public library programming; Large Language Model (LLM)

INTRODUCTION AND LITERATURE

Generative AI (GenAI) not only gives a choice of various educational content presets but can also dynamically create customized content that will meet learners' individual needs (Bilal, He, & Liu, 2025; Khazanchi & Khazanchi, 2024). While most research highlights the capabilities of GenAI, it is equally important to pay attention to users' points of view, especially on how learners as active users utilize GenAI to drive their own learning (Borge et al., 2024). Meanwhile, we view *maker-based learning* as a method to offer learner-driven contexts where children and their caregivers could initiate collaborative learning as they create tangible artifacts. Maker-based learning emphasizes the processes of making, through which learners engage in tinkering, exploring, designing, and creative thinking (Bevan et al., 2014; Jung et al., 2023). However, little research to date has focused on the intersection of AI and maker education; DiCarlo et al. (2022) explored the use of AI for a new algorithm to detect any safety issues related to large-scale equipment (e.g., CNC machine), but this study did not address the use of AI for the purpose of facilitating learning in makerspaces. Therefore, it is timely to examine the potential of GenAI applications, especially a Large Language Model (LLM)-enabled chat system, in maker-based learning and its contribution to pedagogical enhancement in informal STEM learning as well as children's AI literacy development. This paper aims to address the **research question**: *How do children and their caregivers use the LLM-enabled chat system as they engage with maker-based STEM learning during a library workshop?*

METHODS

Intervention: STEM Education Program at Public Libraries

We designed a hands-on STEM education program for children (aged 6-12) and their caregivers by collaborating with four public libraries from the southern region of the United States. For the program, we utilized a prototype LLM-enabled chat system with language models to facilitate online learning and information-intensive task completion and tested its usability in a series of pilot studies (Jung et al., 2024). The prototype system operated with the GPT-4 model in the background and supported families' information-seeking and retrieval, brainstorming, information summarization, and question-answering during the maker-based activities. With participants' consent, we stored and analyzed their chat logs data collected remotely through the prototype chat system, along with the video recordings and transcripts collected during and after the maker-based learning sessions.

The library program was developed for 1 to 1.5 hours long one-time workshops for hands-on STEM learning with clay circuitry kits (i.e., Squishy Circuits, with which people could make creative circuits with clays, battery pack, and LED lights) and GenAI (i.e., our LLM-enabled prototype chat system built with ChatGPT API). Each family worked as a group and shared the materials in maker-based learning activities (e.g., one kit of Squishy Circuit, one laptop, and four to five clays of different colors; see Figure 1-left). The maker activities included: using the GenAI chat system to figure out what Squishy Circuits are and how to create clay-based creative circuits with available materials; and making creative circuits of their choices (e.g., a car with two LED headlights).

Data Collection and Analysis

This proposal highlights the preliminary analysis of three families from the full data set. We collected two types of data: log data (e.g., chat logs) from the prototype chat system and video recordings of the families' maker-based learning activities. For preliminary analysis, a qualitative thematic analysis (Glesne, 2015) of the chat data and a video-based interaction analysis (Jordan & Henderson, 1995; Nassauer & Legewie, 2021) of the video data were conducted to understand the contexts and situations when children's interactions with the chat system occurred.

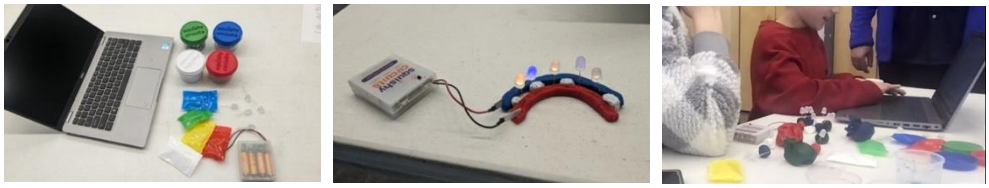

Figure 1. Materials provided for each family (left); Example artifact created with Squishy Circuits (middle); A family experiencing challenges during their making and using the chat system (right)

FINDINGS

Developing Prompts for GenAI Chat System while Learning about the New Circuit Kit

Families often started with a question to understand how Squishy Circuits work, but then sometimes they seemed overwhelmed by the system's lengthy response. Then, the facilitators informed the families that it would be possible to ask for a summary or shorter responses via a reformulated prompt. Throughout this process, children and their caregivers experienced developing their prompts iteratively to obtain the results they would be satisfied with. For example, a family of a mother and two children (aged 9 and 11 each) shaped their prompts multiple times. At first, they used "*What are Squishy Circuits?"* which brought in a lengthy response, so they re-prompted, "*[P]lease summarize [your] response to make it shorter."* They did not seem to be satisfied with the results and submitted one more prompt with more specific criteria "*[S]ummarize [it] please so a 4th grader can understand."* This example shows that the family learned not only about Squishy Circuits but also developed skills for forming prompts.

Troubleshoot Attempts (Not Successful) with GenAI

Often participants had concrete ideas of what shape they would want to make with clay. However, when confronting some challenges, such as when their LED lightbulbs did not light, families tended to seek help from GenAI. For instance, a family with a mother and a son (aged 10) had a hard time trying to figure out how to make a necklace-shaped circuit with multiple LED lights (see Figure 1-right), and the facilitator reminded them they could use the GenAI saying, "you can always ask [GenAI] what's wrong with the necklace." Then, they typed in the chat box.

> [7] Participant's prompt: *how do I make a necklace of conductive dough and led lights in squishy circuits?*
> [8] GenAI's response: *Making a necklace using conductive dough and LED lights [...text omitted...]*
> [9] Participant's prompt: *what if it doesn't work*
> [10] GenAI's response: *[8 of the troubleshooting steps were provided; text omitted...]*
> [11] Participant's prompt**:** i got 8 balls of condu[c]tive dough

The child typed a general question (line [7]) about how to make a necklace, followed by a question about their challenge (line [9]) and then their specific situation (line [11]). After this prompt [11], the GenAI responded with five different experiment ideas, with a statement, "*Use the remaining conductive dough to create multiple "islands"…[text omitted]… but are not touching each other directly."* The family rearranged their circuits as the mother said, "to make sure everything's not touching." Despite multiple attempts, they were still unable to make the lights until the facilitator helped. This example represents the limitation of current GenAI tools in situated feedback for complicated maker-based problems and a need for adaptive learning support integrating real human facilitation.

CONCLUSION

Aligned with the conference theme, our findings reveal the potential of integrating GenAI into maker-based learning as children and their caregivers engaged in typing and revising their prompts to obtain satisfactory new contents. This practice could be a way of supporting prompt engineering, which is critical for advanced AI literacy (Knoth et al., 2024). Also, utilizing chat and search systems in our maker-based learning program provided an opportunity for children to spark new interest in both AI and circuitry (Liu & Jung, 2021). We also identified some pitfalls where AI could not provide *in-situ* feedback for challenges that occurred in the making. We acknowledge our limitations by including a small portion of our dataset, but our research can inspire future work on AI-assisted learning.

GENERATIVE AI USE

We confirm that we did not use GenAI tools/services to author this submission except to check grammar errors.

AUTHOR ATTRIBUTION

Yong Ju Jung: conceptualization, formal analysis, funding acquisition, investigation, methodology, project administration, writing – original draft; Jiqun Liu: conceptualization, funding acquisition, investigation, resources, software, writing – review and editing; Mahdieh Nazari: investigation, project administration, writing – review and editing; Harun Karahan: investigation, project administration, writing – review and editing.

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A GenAI Approach to Suggesting Broad and Narrow Queries for Exploratory Search

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ABSTRACT
Query reformulation is a critical aspect of the exploratory search model. During exploratory browsing, searchers issue broad queries to learn about the breadth of the topic; during focused searching, they issue narrow queries to learn about a specific aspect of the topic. Typically, little support is provided by the search interface to help searchers refine and reformulate their queries. This research addresses this gap, demonstrating a generative AI approach to suggesting both broad and narrow queries. Using a timeline of past search activities (queries issued and search results saved), the approach allows searchers to reformulate their queries based on specific saved search results, previous queries issued, or the current query. This gives the searcher interactive control not only over whether to request broad or narrow query suggestions, but also upon what information to base those suggestions.

KEYWORDS
Exploratory search; query reformulation; search interface design; generative AI

INTRODUCTION
Searchers engage in look-up search when they have a clear goal and understanding of what they are seeking (Marchionini, 2006). However, when they undertake complex search tasks that are ambiguous and open-ended (Soufan et al., 2022), look-up search approaches are not sufficient. Exploratory search is a more suitable model for undertaking complex search tasks, where information gathering occurs through an exploratory browsing style of searching to learn about the breadth of the topic, and focused searching to learn about specific aspects of the topic (White & Roth, 2009). In both styles of searching, query reformulation is critical.

In this research, we consider the challenge of public library patrons searching within unfamiliar domains and undertaking exploratory search processes. Providing explicit support for query reformulation is important, given the diverse backgrounds and skill levels of public library patrons. We propose an approach that allows the searcher to interactively choose the source of the query suggestions, and whether they would like broad or narrow suggestions.

LITERATURE REVIEW
Users engaged in complex search tasks often face uncertainty about what to search for and how to proceed (Hoeber & Shukla, 2022; White & Roth, 2009). Exploratory search addresses this through two phases: exploratory browsing for discovery and learning, followed by focused searching as understanding deepens. The nature of the queries used varies across the two search phases. During exploratory browsing, users tend to issue general queries aimed at increasing topic comprehension. In contrast, focused searching involves more precise queries aligned with specific information needs (White & Roth, 2009). Query reformulation also depends on user expertise: novice users often use broad queries, while more experienced users tend to craft precise ones (Aula, 2003). Query length can be indicative of information need; longer queries are associated with focused search intentions (Phan et al., 2007).

Interactive query reformulation methods have been proposed to help users during exploratory search. One approach recommends possible terms to modify the original input query, based on clicked documents and previously submitted queries (Vu et al., 2017). Another shows a list of queries that retrieves documents similar to those presented on the search engine result page (SERP), supporting contextual relevance during query reformulation (Medlar et al., 2021). Query expansion through drag and drop interfaces has also been developed, enabling users to interactively refine their queries using suggested keywords (Payandeh et al., 2025). A query preview control that displays the number of retrieved documents before issuing a query has been shown to support query reformulation by helping users retrieve more relevant and diverse documents (Qvarfordt et al., 2013). Additionally, identifying missed details using heuristic approaches has proven beneficial in refining queries interactively (Zhang et al., 2022).

APPROACH
Since exploratory search does not follow a single direct path to desired results (Athukorala et al., 2016), it is difficult to predict when users will need broad queries (exploratory browsing) or narrow queries (focused searching). The goal of our research is to assist users in query reformulation by offering suggestions for both types of queries by selecting the appropriate icon in the interface. Built on a timeline of previous search activities (Hoeber et al., 2025), the interface anchors query suggestions to three elements of the user's search history (see Figure 1). When a suggestion is triggered from a saved search result in the timeline (1), it is based on the search result and its parent query. For a query in the timeline (2), suggestions are based on that query and all associated search results that were saved while using any subsequently un-saved results as negative information. When the suggestion is based on the

current query (3), the suggestions are generated based on the current query session. Query suggestions are provided in a ranked list (4), along with a visual indicator of how many search results will be returned for each, leveraging information visualization to provide information scent cues (Pirolli & Card, 1995; Ward et al., 2010)

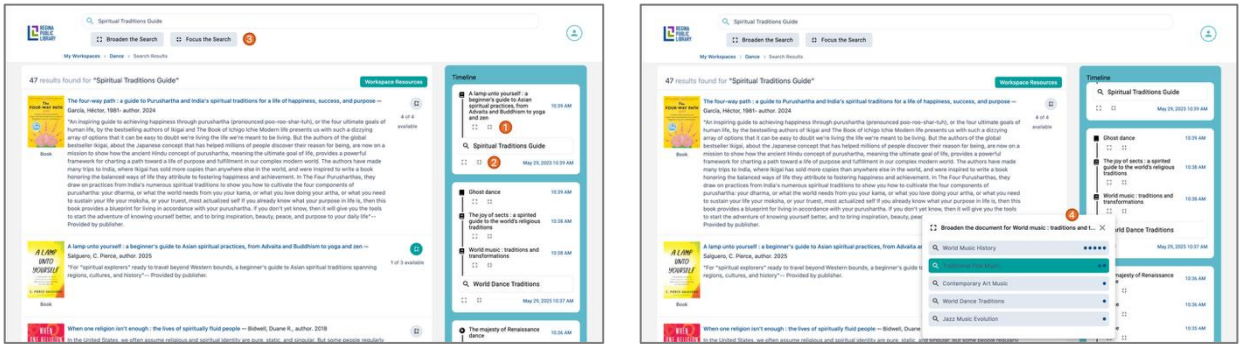

Figure 1. Access to query suggestions is provided via icons under each saved search result and each query in the timeline, as well as under the current query. Query suggestions are provided via a modal window.

Structured prompting to separate tasks from instructions (Dang et al., 2022), few-shot learning with example outputs (Brown et al., 2020), and GPT-4.0 are deployed for generating query suggestions. The prompt consists of five sections. First, it defines a fixed role as a "helpful library search assistant." Second, it tunes the task differently for broad and narrow queries. For broad queries, the prompt instructs the model to "use the following information to suggest 10 broad search ideas that are easy for beginners," while for narrow queries, it requests "15 specific suggestions" based on the provided input. The third section defines the input information, which varies depending on whether the query suggestion is for a particular saved result, a past query, or the current query, as discussed earlier. The fourth section provides tailored instructions depending on whether broad or narrow queries are requested. Broad queries focus on high-level concepts with fewer than five words, favoring nouns and verbs while minimizing modifiers. Generalization and parallel movement are emphasized, while synonym replacement is included but deemphasized due to user preference for conceptual shifts. Narrow queries typically contain five to ten words, incorporating adjectives and adverbs when needed. They rely more on synonym substitution for refining terms, and on specialization to narrow the topic to a subdomain (Rieh & Xie, 2006; Phan et al., 2007; Selvaretnam & Belkhatir, 2012). Finally, the fifth section provides two examples, which are also dependent on whether broad or narrow query suggestions are requested. "Organic gardening" can be broadened to "sustainable farming" through parallel movement, and "climate change impact" to "environmental issues" through generalization. The narrowing examples are refining "home gardening" to "pest control in vegetable gardens" (specialization), and "teaching strategies" to "active learning techniques in undergraduate biology" (synonym substitution).

Each generated query suggestion is submitted to the library API to obtain the number of matching search results (Qvarfordt et al., 2013); those with zero search results are pruned from the query suggestion list. When broad queries are requested, these are sorted from highest to lowest corresponding search results; when narrow queries are requested, these are sorted lowest to highest. The top five are provided for interactive selection in the search interface (see (4) in Figure 1). Since some of the query suggestions may not have sufficient topic coverage in the library, the list of query suggestions provided may be less than five (in rare cases where there is limited resource metadata upon which to base the query suggestions, it could be zero).

CONCLUSION

The paper introduces an interface to support public digital library searchers in their query reformulation activities during exploratory search. While building on an existing timeline-based interface, the key novelty lies in allowing users to request either broad or narrow query suggestions, based on saved documents, previous queries, or the current query. The system provides distinct, ranked lists of broadening and narrowing suggestions, giving users interactive control over the direction and scope of their search. This approach is expected to be particularly helpful for searchers conducting exploratory searching, where sometimes there is a need to broaden the search scope and other times there is a need to narrow it. We will validate the approach in forthcoming user studies.

GENERATIVE AI USE

The first author employed ChatGPT-4.0 for the following purpose: grammatical correction of the initial drafts of the writing. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

Hanieh Khakshoor: conceptualization, investigation, software, and writing–original draft preparation; Orland Hoeber: conceptualization, funding acquisition, resources, supervision, and writing–review & editing.

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AI/Misinformation on Social Media: Users' Appraisal and Emotional Outcomes of Their Response

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ABSTRACT
AI bots, deepfakes, and the misinformation they generate on social media prompt users' behavioral and affective reactions. While the relationships between social media use and emotion are frequently studied, less is known about how users' responses (e.g., fact-check, report posts/posters) are related to affective outcomes. This survey of undergraduates using X (known for AI bots and misinformation) found that Disappointed, Disgusted, and Angry were the top emotions after users responded to issues on social media. A latent class analysis identified four user profiles. The most prevalent class shows positive emotional outcomes, but mixed with anxious feelings. The latter was notable across multiple profiles, suggesting an area for intervention.

KEYWORDS
Information behavior; Affective outcomes; AI on social media; Misinformation; User profiles

INTRODUCTION
The broadening availability of AI tools and content (e.g., AI bots and deepfakes) has heightened concern about the already serious issues of dis/misinformation (Benzie & Montasari, 2022), prompting calls for more information and media literacy education, including training on fact-checking and recognizing deepfakes (IFLA, 2020; Zhou et al., 2023). While there is considerable research on how social media use (e.g., frequency of use) is related to users' emotions and well-being (e.g., anxiety, depression) (Du et al., 2024), less is known about the more specific question of how users' responses to AI and dis/misinformation problems (e.g., fact-check, rebuttal, etc.) are related to different emotional outcomes. This initial study thus seeks to explore two research questions (RQs): (RQ1) What are users' emotions after they take actions on dis/misinformation on social media?; (RQ2) What are the user profiles regarding emotional outcomes, in relation to their use purposes, appraisals of importance of issues to address and self-efficacy, actions taken to address issues, and intention to continue usage? The information behavior literature has highlighted the importance of affect (Nahl & Bilal, 2007) and the value of outcome research (Case & O'Connor, 2016). Understanding users' emotional outcomes and profiles can contribute to research and more comprehensive interventions on information literacy (IL), such as identifying potential emotional barriers and fine-tuning intervention focus based on users' profiles.

The study's conceptual framework (six categories and 24 variables) is informed by Stress and Coping literature, particularly Lazarus' transactional model (TM). TM conceptualizes positive and negative feelings as an immediate outcome of an individual's appraisal and actions to stressful encounters, posited as being shaped by personal (e.g., goals) and environmental factors (Lazarus, 1999). Applying the model, this study selected X (formerly Twitter) as the environment, as X is notable for AI bots and the misinformation they generate (Corsi et al., 2024; Singh, 2025). For *personal goals*, the study included the frequency of using X for different goals (e.g., information-seeking, information-sharing) drawn from the social media uses & gratifications literature (e.g., Alhabash & Ma, 2017). Appraisals included two types, drawn from TM. *Primary appraisal* (PA) captured whether respondents think it is important to tackle dis/misinformation and related issues (e.g., deepfakes, AI bots). *Secondary appraisal* (SA) captured respondents' self-efficacy: how confident they are about their ability to recognize dis/misinformation and deepfakes (Lazarus, 1999; Sin & Kim, 2023). User *actions* responding to AI and dis/misinformation included fact-checking, blocking users, reporting posts/posters, and posting rebuttals. For *emotional outcomes*, the study followed Lazarus' (1999) list of 15 emotions, asking, "to what extent do you feel the following emotions after you responded to dis/misinformation on X?" Another outcome, *intention to continue usage*, which is often used in social media and technology adoption studies, was also included.

METHODS
Data were collected in Spring 2025 using an online questionnaire. Emails were sent to undergraduates at a U.S. university to invite X users to participate in the study. Institutional Review Board approval was obtained, and participation was voluntary. RQ1 generated descriptive statistics of the 15 emotions. RQ2 was analyzed using the R package poLCA (Linzer & Lewis, 2011) for Latent Class Analysis (LCA), a method for identifying user profiles from categorical variables (Collins & Lanza, 2010). Variables were dichotomized based on the median. The top eight emotions from RQ1 were included in RQ2. A 4-class model was selected for its lowest BIC (82813), second-lowest AIC (7923.2), and satisfactory entropy (0.88) among the tested models (Nylund-Gibson & Choi, 2018).

RESULTS

The study collected 275 usable responses. Most respondents were in their 20s (60.7%), followed by those under 20 (38.2%). The gender composition was women (50.5%), men (45.8%), and others (3.6%). Figure 1 illustrates the descriptive statistics and distribution of the emotional outcome variables (RQ1). Based on mean scores, the top three emotions were Disappointed, Disgusted, and Angry. Negative emotions were more prominent. The highest positive emotion was Confident (ranked 7th out of 15).

Figure 1. Emotional outcomes after responding to misinformation: Box and violin plots

Figure 2 shows the four class profiles using radar charts. A larger slide in the graph indicates the class has a *higher probability* of having an *above-median score* on a variable (for brevity, the text below refers to this as a *high* score).

Class 1 constitutes the largest share of the sample (32.5%). This class stands out with a high likelihood of positive emotions (e.g., Happy, Hopeful, Eager) while scoring low on PAs (importance of addressing AI/misinformation issues). This class is moderately likely to use X for Information Sharing and Social Connections.

Class 2 (30.2%) has a moderate probability of scoring high on PAs (importance), actions (Report posts/posters, Block users, and Fact-check), and negative emotions (e.g., Anxious). Class 2 tends to score low on positive emotions.

Class 3 (26.4%) has low scores on almost all variables. Within Class 3 and across the 24 variables, this class's highest result is on SA (self-efficacy in recognizing deepfakes; 49% probability of having a high score).

Class 4 (11.0%) leans toward high scores, particularly in PAs (including a near 100% probability of scoring high on the importance of tackling AI/misinformation issues). Class 4 is very likely (near 100% probability) to use X for Information Sharing and quite likely for Status Building. Among the four classes, this is the only class scoring high on Rebutting dis/misinformation. This class also scores high on both positive and negative emotions, with the highest probability being feeling Anxious, followed by Eager. Among the 24 variables, the slightly lower ones for Class 4 were related to SA (self-efficacy) and feeling Confident.

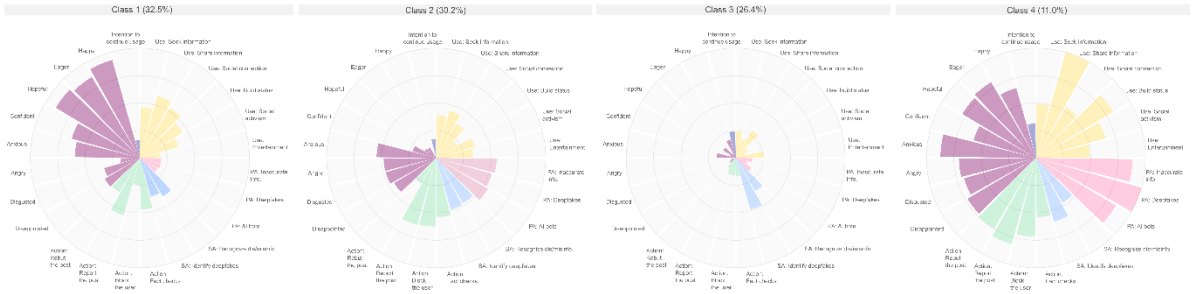

Figure 2. Latent class profiles

DISCUSSIONS AND CONCLUSION

The study identified four user profiles. A notable finding is the presence of high Anxiety scores in most classes, even among those with high positive emotions (Classes 1 and 4). This calls for both research and IL education intervention to address anxious feelings after users respond to dis/misinformation. Future studies may focus on investigating the reasons behind this feeling and how it inhibits or promotes future behaviors.

The findings also have practical implications, including areas on which information and AI literacy education may focus for each class. While scoring high on positive emotions, Class 1 may need help in evaluating the importance of addressing dis/misinformation issues (PA). For Class 2, scoring high on actions (fact-check, block, and report), IL education may focus on strategies for facilitating more positive emotions (e.g., by offering feedback, using real and interesting example cases). For Class 4, IL educators may investigate the relatively lower scores on SA (self-

efficacy) and Confident feeling and look for strategies for improving both. Further understanding of IL strategies' emotional outcomes could contribute to advancing the affective components of IL research and training.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Kyung-Sun Kim: conceptualization, methodology, data curation, formal analysis, writing – original draft; Sei-Ching Joanna Sin: methodology, formal analysis, visualization, writing – review and editing.

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Survival Analysis of Career Retention among LIS Professionals of Color

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ABSTRACT
This study employs survival analysis to examine factors influencing job departure among library and information science (LIS) professionals, with a particular focus on professionals of color. It investigates how perceived fair treatment impacts retention, comparing experiences between professionals of color and their White counterparts. Findings indicate that perceived fair treatment is significantly associated with lower turnover rates among professionals of color. In contrast, this factor does not significantly influence job departure among White professionals. These results underscore the critical role of perceived fairness in workplace treatment for retaining LIS professionals of color. The study concludes by discussing implications for advancing equity, diversity, justice, and inclusion (EDJI) within the LIS field, offering insights for policies and practices aimed at fostering more inclusive and supportive work environments.

KEYWORDS
Diversity, equity, and inclusion; librarian retention, fair treatment.

INTRODUCTION
The lack of professionals of color in the library and information science (LIS) field remains a critical issue (Rosa & Henke, 2017). As noted by Kung, Fraser, and Winn (2020), this lack of diversity is evident in both Canada and the United States. For example, according to Statistics Canada's 2016 Census, only 1,055 of the 9,570 librarians (11%) identified as members of a minority group, even though minorities made up 22% of the Canadian population at the time. Promoting racial and ethnic diversity within the LIS workforce is essential to delivering fair and inclusive services to increasingly diverse populations. Yet, professionals of color often encounter systemic obstacles, discriminatory practices, and inequitable treatment, all of which contribute to their elevated turnover rates (Caragher & Bryant, 2023; Harper, 2020).

This study examines the impact of perceived fair treatment on job retention among LIS professionals, with particular attention to racial differences in these effects. Using survival analysis on data collected from professionals in LIS in 2023, we investigate whether fair treatment significantly predicts retention over time and whether its influence differs between professionals of color and their White colleagues. Survival analysis offers a robust approach for analyzing patterns of attrition and retention over time in longitudinal data (Allison, 2010; Singer & Willett, 2003). This study centers on perceived fair treatment as a primary factor influencing retention, due to its well-established relevance for professionals of color in the LIS profession (Alabi, 2018; Gibson, 2019; Harper, 2020; Jennings & Kinzer, 2022). The research questions guiding this study are as follows:

- Does perceived fair treatment significantly predict retention probability over time?
- If so, does its impact vary across different racial groups?

METHODS
This study included 470 Library and Information Science (LIS) professionals, 165 of whom identified as non-White. Participants graduated after 2009 and held their first LIS position by 2019. Data were collected in 2023 as an extension of the "Workforce in Library and Information Science" (WILIS 2) project (Marshall et al., 2010; Rathbun-Grubb, 2009), which surveyed LIS graduates from 2000 to 2009. Our study recruited LIS professionals through direct emails to LIS program alumni (when contact information was provided by the program) and postings to alumni and librarian listservs (e.g., JESSE), using a recruitment email with a survey link. Participants were eligible if they held an MLIS degree or equivalent earned between 2010 and 2019. Individuals who required legally authorized representatives or had cognitive impairments were excluded from the study.

The primary outcome variable was job departure status, coded as 0 for those still employed in their first LIS job and 1 for those who had left. We also measured the duration of employment from the start of their first LIS job through 2023. A central independent variable was perceived fair treatment in the workplace based on race/ethnicity ("fair"), measured with items such as: "My supervisor was unwelcoming toward me because of my race/ethnicity," "My opinion was overlooked in a group discussion because of my race/ethnicity," "A co-worker was unwelcoming toward me because of my race/ethnicity," "A community member was unfriendly toward me because of my race/ethnicity," "I was ignored at work because of my race/ethnicity," and "Someone assumed that my work would be inferior to that of people from other racial/ethnic groups." These items were developed based on existing survey

instruments (e.g., Alabi, 2015; Nadal, 2011). Responses ranged from 1 (strongly agree) to 7 (strongly disagree), with higher scores indicating greater perceived fairness.

To explore racial differences, we included a binary variable for race ("Nwhite"; 0 = White, 1 = Non-White) and an interaction term (fair:Nwhite) to examine whether the effect of fair treatment on retention varied by racial group. Additional covariates included marital status ("relationship"; 0 = Not married, 1 = Married) and overall job satisfaction ("overall"), assessed using the item: "Overall, I am satisfied with what I do in my job," rated on a 4-point Likert scale from strongly disagree to strongly agree. We employed discrete-time survival analysis (Allison, 2010; Singer & Willett, 2003) across 13 years to estimate the probability of job departure. This approach enabled a flexible, non-parametric modeling of time. Analyses were conducted in R using multiple imputation to address missing data (RStudio Team, 2020; Singer & Willett, 2003; UCLA, 2024). We used the following R packages: discSurv (Welchowski et al., 2022), dplyr (Wickham et al., 2023), mice (van Buuren & Groothuis-Oudshoorn, 2011), psych (Revelle, 2024), and survival (Therneau, 2020).

RESULTS

Table 1 presents the analytical findings. Among White professionals, perceived fair treatment did not have a statistically significant relationship with job departure ($e^{(coefficient)} = 0.217$, $p > 0.05$). In contrast, the interaction term (fair:Nwhite) was significant ($e^{(coefficient)} = -0.552$, $p < 0.001$), suggesting that the effect of fair treatment on retention varies by racial identity. Specifically, professionals of color who experienced greater levels of fair treatment were substantially less likely to exit their positions, underscoring the protective role of equitable workplace experiences for this group.

	estimate	std.error	statistic	df	p.value
timeInt1	-0.51127483	2.77E-01	-1.84722035	1010.9017	6.50E-02
timeInt2	-0.54645874	2.87E-01	-1.90537562	1062.4616	5.70E-02
timeInt3	-0.71618636	3.02E-01	-2.37193029	1093.5526	1.79E-02
timeInt4	-1.43226053	3.48E-01	-4.11659232	1169.4874	4.12E-05
timeInt5	-1.24263587	3.74E-01	-3.32157307	1308.4286	9.20E-04
timeInt6	-1.31257775	4.30E-01	-3.05592075	1426.1469	2.29E-03
timeInt7	-1.55569437	5.08E-01	-3.06038684	1461.1799	2.25E-03
timeInt8	-0.97339485	4.94E-01	-1.96900658	1465.4766	4.91E-02
timeInt9	-1.41943782	6.71E-01	-2.11467421	1533.8086	3.46E-02
timeInt10	-1.13233876	6.80E-01	-1.6640199	1537.8627	9.63E-02
timeInt11	-15.03897844	4.37E+02	-0.03443512	1562.8414	9.73E-01
timeInt12	-15.01191695	5.47E+02	-0.02745786	1562.8414	9.78E-01
timeInt13	-14.76781241	1.46E+03	-0.01014693	1562.8414	9.92E-01
ft	0.21770707	1.39E-01	1.57132106	1013.1216	1.16E-01
overall	-0.09022633	4.86E-02	-1.85503003	656.9938	6.40E-02
pd	0.01782495	7.71E-02	0.23112552	398.2961	8.17E-01
Nwhite1	-0.02086634	1.59E-01	-0.13139231	1150.6319	8.95E-01
ft:Nwhite1	-0.55169072	1.72E-01	-3.21353274	1505.7517	1.34E-03

Table 1. Discrete Time Survival Analysis Results

DISCUSSION

Retaining a diverse and skilled workforce is essential to the long-term health and relevance of the library and information science (LIS) field (Rosa & Henke, 2017; Yoon & McCook, 2021). However, the persistent and disproportionate attrition of racial and ethnic minority librarians remains a major concern (Jones & Murphy, 2019). Gaining a deeper understanding of the factors driving their departure is critical for informing targeted and effective retention efforts.

This study advances that understanding by investigating the link between perceived fair treatment and job departure among LIS professionals of color. Using survival analysis, our results highlight the pivotal role that perceptions of fairness play in the retention of this important segment of the workforce. Fostering equitable and respectful workplace environments can significantly improve retention outcomes (Alabi, 2018; Jennings & Kinzer, 2022).

Additionally, our findings reveal that the effect of fair treatment varies across racial groups, pointing to the need for culturally responsive and group-specific retention strategies (Espinal, Sutherland, & Roh, 2018). A one-size-fits-all approach may not address the nuanced challenges faced by different communities.

CONCLUSION

In conclusion, retaining professionals of color is essential to building a diverse and inclusive LIS field. Addressing early-career attrition through a strong culture of fair treatment can enhance equity and belonging, ultimately improving retention rates and strengthening the profession's capacity to serve diverse communities effectively.

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GENERATIVE AI USE
We employed ChatGPT for the editing purposes.

AUTHOR ATTRIBUTION
Sunha Kim: conceptualization, methodology, data curation, formal analysis, funding acquisition, writing – original draft and writing – review and editing; Amy VanScoy: project administration, funding acquisition, supervision, writing – review and editing; Weiyi Ding: data curation, preliminary data analysis

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The Relationship between Spatial Inequality of Public Libraries and Local Extinction in South Korea

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ABSTRACT
This study investigates the relationship between public library accessibility and local extinction risk in South Korea. Using data from 229 municipalities from the years 2013, 2018, and 2023, the study analyzed the number of public libraries, service coverage, and accessibility. Spatial analysis was conducted using QGIS, and correlation analysis was conducted using SPSS. Results show a general improvement in accessibility, yet areas at higher extinction risk remain underserved. A statistically significant correlation between the extinction risk index and library accessibility was observed across all years, suggesting an increasing degree of spatial inequality. Despite national efforts to expand infrastructure, vulnerable regions continue to face limited access. As public libraries are essential for digital literacy and social inclusion, especially in the AI era, spatially equitable policy interventions are needed to reduce information inequality and support regions at risk of local extinction.

KEYWORDS
Disparity of public libraries; Spatial inequality; Local extinction; Public library accessibility

INTRODUCTION
Changes in social structure due to population decline and aging are a worldwide phenomenon. South Korea is no exception, and this has led to concerns about local extinction. In the era of AI, public libraries serve as key institutions for enhancing digital literacy and as essential spaces for fostering social connectivity (Ridley & Pawlick-Potts, 2021; Igarashi, Koizumi, & Widdersheim, 2023; Halaburagi & Mukarambi, 2024). Accordingly, constructing public library infrastructure that ensures equitable access to information is crucial. Without libraries that both address the digital divide and enhance access to generative AI technologies, information inequality is likely to intensify. Therefore, public libraries should be located with spatial equity in mind, ensuring services reach areas at risk of extinction. This study aimed to identify the spatial disparities in public library distribution and accessibility across South Korea, and to analyze the relationship between spatial inequality and local extinction using correlation analysis.

METHODOLOGY AND DATA COLLECTION
This study covers 229 municipalities in South Korea, using the number of public libraries, the range of library services, and library accessibility as variables. The temporal scope was based on three points in time: the most recent statistical year, 2023, as well as five and ten years prior, 2018 and 2013, respectively. Location data of municipalities was obtained from the Statistical Geographic Information Service plus (SGIS+) provided Statistics Korea, and location data of public libraries was collected by geocoding each library address listed in the library information of the National Library Statistics System and converting it into spatial data. QGIS was used for the construction and visualization of spatial data, and SPSS 28.0 was employed for the correlation analysis.

RESEARCH SCOPE AND CURRENT STATUS
Current Status of Public Libraries
South Korea has steadily pursued policies to expand public libraries. As a result, the number of public libraries in Korea increased 1.5 times over 10 years, from 865 in 2013 to 1,096 in 2018 and 1,271 in 2023 (Table 1).

category	2013	2018	2023
Number of Public Libraries	865	1,096	1,271

Table 1. Number of Public Libraries

Current Status of Local Extinction
The term “local extinction” was introduced by Hiroya Masuda in Japan in 2014, refers to a situation in which a local population declines to the point that maintaining basic public services and infrastructure becomes difficult. The local extinction risk index refers to female population aged 20 to 39 years divided by the population aged 65 years and over, and a region is considered to be entering the extinction risk stage if the index is less than 0.5(level 4 and level 5). In the case of South Korea, the entire country-excluding the capital area and major regional cities-is classified as an area at risk of extinction, and these areas have expanded over time (Figure 1).

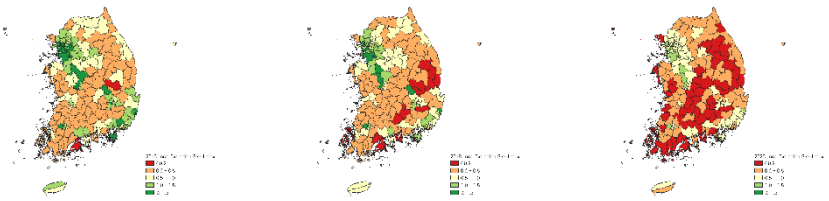

Figure 1. distribution of local extinction index (2013, 2018, 2023)

RESULT

Public Libraries Service Area

Based on an analysis of public library service areas (within a 2 km radius), 146 municipalities (63.8%) had less than 20% of the total area covered in 2013. This number decreased to 141 (61.6%) in 2018 and 135 (59.0%) in 2023, suggesting a slight alleviation of spatial inequality in library access (Table 2). In contrast, the number of municipalities with less than 20% library service coverage that also fall into the extinction risk category (risk index of 0.5 or less) was 77 in 2013 (25.8%). Ironically, this figure increased to 89 (29.8%) in 2018 and 113 (49.3%) in 2023, indicating that the library provision remains insufficient, especially in areas at risk of extinction.

category		Local extinction risk index					total
		Level 1	Level 2	Level 3	Level 4	Level 5	
2013	< 20%	7	22	40	**75**	**2**	146
	≥ 20%	31	38	14	0	0	83
2018	< 20%	4	11	37	**76**	**13**	141
	≥ 20%	8	34	43	3	0	88
2023	< 20%	0	2	20	**60**	**53**	135
	≥ 20%	0	13	68	13	0	94

Table 2. Local Extinction Risk Index (Three Time Points)

Public libraries accessibility

The average distance to public libraries decreased from 5,232 meters in 2013 to 4,770 meters in 2023, while the number of municipalities with access within 2 km increased from 73 to 87, indicating overall improved accessibility. However, correlation analysis revealed a statistically significant relationship between library accessibility and the local extinction risk index (Table 3), showing that regions with a higher risk of extinction tend to be located farther from libraries. In particular, the consistently strong correlation coefficient (r) across all three time points, along with its increasing magnitude over time suggest a widening disparity in library accessibility in regions facing a higher risk of local extinction, thereby indicating a deepening inequality in the provision of library services.

category	2013	2018	2023
Pearson Correlation Coefficient	-.674**	-.679**	-.707**
**p<0.01			

Table 3. Pearson Correlation Coefficient (Three Time Points)

CONCLUSION

This study investigated the spatial distribution and accessibility of public libraries in South Korea, focusing on their relationship with the local extinction risk index. While overall accessibility to public libraries has improved over the past decade, spatial disparities remain in areas at risk of local extinction. In particular, the correlation analysis indicates that regions with a higher risk of extinction tend to have poorer access to public libraries. These findings suggest that while national efforts to expand library infrastructure have yielded some positive outcomes, they have not sufficiently addressed the needs of vulnerable regions. Public libraries play a critical role in mitigating information inequality, especially in the AI age. Therefore, it is imperative to adopt more spatially equitable library policies that prioritize at-risk regions.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION STATEMENT

Koo, Bonjin: Conceptualization (lead); writing – original draft (lead); formal analysis (lead); writing – review and editing (equal); Methodology (lead). Chang, Durkhyun: supervision; writing – review and editing (equal). Kim, Minwoo: Writing – original draft (supporting)

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Coconut Libtool 2.0: Enhanced All-in-One Data and Text Mining Tool

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ABSTRACT
Textual analysis remains challenging for researchers, students and practitioners without programming expertise, creating barriers in social sciences and humanities research. This poster presents Coconut Libtool 2.0, an enhanced web-based application that makes advanced textual analysis and visualization accessible to everyone. Building upon version 1.0, Coconut Libtool 2.0 significantly expands data source integration to include HathiTrust digital library, Dimensions, and PubMed, alongside existing Scopus, Web of Science, Lens, and customized file support. Enhanced text and visualization techniques include established methods for topic modeling, network text analysis, and keyword stemming, in addition to new features such as burst detection, sentiment analysis, and scattertext visualization.

KEYWORDS
Text analysis tool; Open science; Natural language processing (NLP); Informetrics; Digital humanities

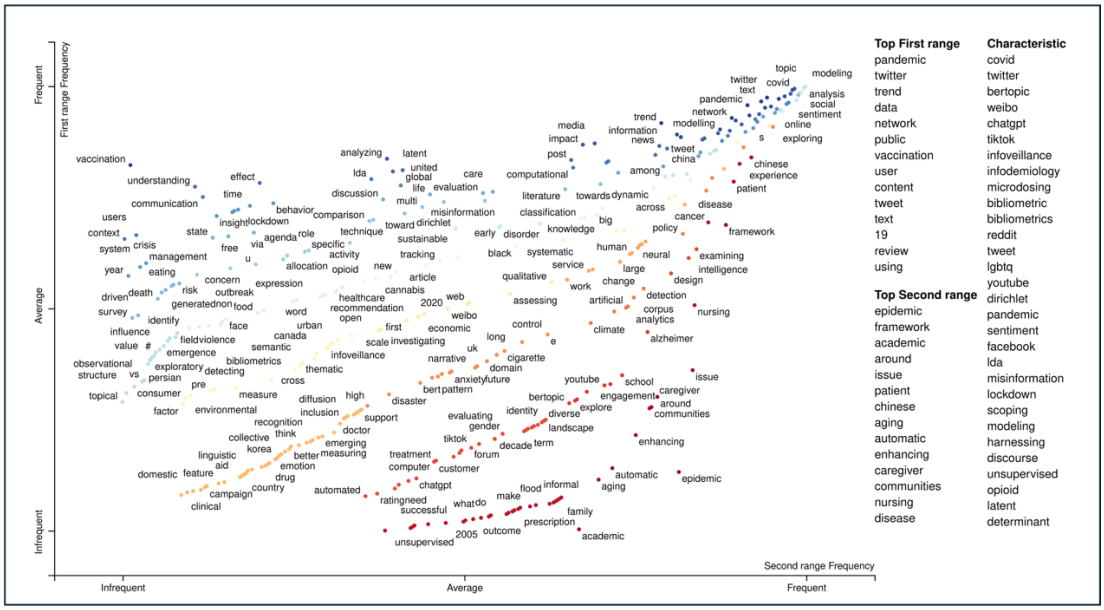
INTRODUCTION
Textual analysis remains inaccessible to many researchers and practitioners due to technological barriers, particularly the coding proficiency required by existing methods. The Coconut Libtool (Santosa et al., 2024) seeks to overcome these challenges by offering a user-friendly, web-based application that leverages natural language processing technologies. Its goal is to make advanced textual analysis more accessible to users without programming expertise. This poster introduces Coconut Libtool 2.0 (https://www.coconut-libtool.com/), an updated and enhanced version of the original tool designed to improve both accessibility and usability. This new release builds on the foundation of the previous version (Santosa et al., 2024) by incorporating additional analytical techniques and expanding the range of supported data sources. This application aims to support researchers, students, and practitioners in the field of social sciences and humanities by providing an accessible space for using text mining and visualization techniques and to promote interdisciplinary collaboration.

BACKEND FEATURES AND FUNCTIONS
Coconut Libtool 2.0 represents a substantial enhancement over version 1.0, incorporating numerous new analytical methods, and data sources to significantly improve text analysis and visualization capabilities. The updated platform expands data source integration to read and analyze files from HathiTrust digital library (www.hathitrust.org), Dimensions database (https://www.dimensions.ai/), and PubMed database (https://pubmed.ncbi.nlm.nih.gov/), complementing the original sources of Scopus, Web of Science, Lens, and custom user data files.

The analytical framework of Coconut Libtool 2.0 expands from four to seven text analysis and visualization techniques. The core functionalities of the tool remain the same, including three topic modeling approaches—Latent Dirichlet Allocation (Sievert & Shirley, 2014), Biterm Topic Modeling (Yan, Guo, Lan & Cheng, 2013), and BERTopic (Grootendorst, 2022)—alongside Network Text Analysis (Lamba & Madhusudhan, 2022a), Sunburst Visualization, and Keyword Stemming (Bird, Loper, & Klein, 2009). The updated version of the tool introduces three new text mining and visualization approaches, that is, Burst Detection (Kleinberg, 2002), Scattertext (Kessler, 2017), and Sentiment Analysis.

For burst detection, we used Kleinberg's algorithm via the '*burst_detection*' library (https://pypi.org/project/burst_detection/), to understand the temporal phenomena of the text by identifying patterns, trends, seasonality, anomalies, and sudden activity increases. This technique serves dual purposes by (i) analyzing temporal dynamics to identify emerging terms, track term evolution, and detect usage patterns, and (ii) forecasting future time series values (Lamba & Madhusudhan, 2022b). For sentiment analysis, we utilized '*TextBlob*' (https://textblob.readthedocs.io/en/dev/) and '*vaderSentiment*' (https://pypi.org/project/vaderSentiment/) libraries (Hutto & Gilbert, 2014) to analyze sentiment polarity and subjectivity. In Version 2.0 of the tool, users can now download the results from topic modeling, scattertext, and sunburst features for further analysis or sharing, an option that was not available in the earlier version. The platform maintains its deployment through Hugging Face Spaces (https://huggingface.co/spaces) and Streamlit (https://streamlit.io/).

a. Screenshot of Coconut Libtool 2.0 Features



b. Scattertext visualization made using data from Dimensions

Figure 1: Examples screenshots of the Coconut Libtool 2.0 interface

DISCUSSION, CONCLUSION, AND FUTURE WORK

The new updates significantly enhance Coconut Libtool's analytical and visualization capabilities. Users can now employ burst detection to identify temporal trends and sentiment analysis to assess opinion and subjectivity within their text corpus. The expanded data source integration enables researchers to analyze textual data from Dimensions, PubMed, and HathiTrust Digital Library alongside existing sources. A new downloadable results feature allows advanced users to export outputs from topic modeling, scattertext, and sunburst visualizations for further analysis. Currently, Coconut Libtool supports only English-language data, and some analytical methods require intensive computational resources. Future development will include adding new features such as text summarization and advanced visualization techniques including word shift graphs (Gallagher et al., 2021). We plan to expand compatibility to additional data sources like Semantic Scholar (https://www.semanticscholar.org/) and conduct user studies to evaluate design improvements and guide future enhancements.

GENERATIVE AI USE

Authors confirm that they did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Lamba: conceptualization, methodology, project administration, writing – original draft, writing – review and editing; **Santosa**: data curation, software, visualization, writing – original draft; **Le**: software, visualization

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Best Practices for a Digital Empowerment Program Serving Marginalized Communities

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ABSTRACT
The Digital Empowerment Leadership Program (DELP) at North Carolina Central University (NCCU) takes on issues of digital inequity in underserved communities with a strong community-focused approach. By partnering with local groups, this program blends device distribution digital skills training, and shared decision-making to tackle access and adoption gaps. This write-up outlines lessons learned during DELP's implementation, examines the program's impact on marginalized people in Durham, North Carolina, and discusses challenges encountered and methods to keep such programs going. The findings highlight the necessity of monitoring community needs, reacting to changes, and maintain strong partnerships in order to ensure fair digital access.

KEYWORDS
Digital Empowerment, Marginalized Communities, Partnership Programs, Digital Preparedness, Community Impact

INTRODUCTION
The COVID-19 pandemic exposed racial inequalities across the health, economic, environmental, financial, information and education sectors (Deng & El Hag, 2024). Digital inequity, also referred to as the "digital divide," was exacerbated when the pandemic required an increase in the use of information technology and telecommunications ("Digital Inequity," 2021). NCCU is a premier Historically Black College and University (HBCU) in Durham, North Carolina, recognized this digital inequality and was positioned through its motto of "Truth and Service" to leverage its program partners, expertise, and resources to create a connected community that would address this divide within its communities. To bridge the longstanding digital gap, in 2021, NCCU launched DELP, funded by the National Telecommunications and Information Administration (NTIA) Connecting Minority Communities (CMC) Pilot. The DELP model was fashioned to address barriers to broadband access, affordability, adoption, and digital literacy through a collaborative framework while offering a replicable model for similar initiatives nationwide.

THEORETICAL FRAMEWORK
Digital inclusion research underlines the importance of fairness in promoting social equality. DELP is grounded in community informatics and digital empowerment theory. Community informatics emphasizes using information and communications technology (ICT), supporting community empowerment by outlining how social informatics can facilitate community support through participatory methodologies. Experts like Sandoval (2021) emphasize how the internet serves as a bridge for economic and healthcare prospects, playing a part in public safety and community involvement. The problem of equality is gaining traction as a matter of civil rights. Scholars are encouraging the Federal Communications Commission (FCC) and other regulatory authorities to tackle the gaps in broadband access and affordability (Sandoval, 2021; Bailey & Ngwenyama, 2016). Several efforts have tackled issues surrounding access to technology across different communities (Wedlake et al., 2021). Within social informatics (Smutny & Vehovar, 2019) community participation and empowerment are crucial components (Grady et al., 2024). These programs focus on groups that are frequently excluded, such as the Black and Hispanic communities (Walia & Ravindran, 2020). DELP corresponds with a burgeoning movement that considers digital empowerment a civic right by emphasizing community knowledge, participatory design, and legislative advocacy (Gorski 2009).

COMMUNITY NEEDS ASSESSMENT
To ensure that the program activities and initiatives were designed to meet the community members' needs of our anchor communities, DELP collaborated with its local partners to assess the digital equity needs and other pain points related to digital equity (Cofie et al., 2022). An initial stakeholder mapping survey was administered to identify the critical needs in the community and build alignment between the community stakeholders and DELP. This effort was reviewed and approved through the Institutional Review Board (IRB) at NCCU. The assessment involved administering surveys in libraries and community centers and collecting responses online. Sample sizes exceeded 100 participants across Durham zip codes, with representation from low-income households, Black and Hispanic populations, and various age groups.

GOVERNANCE AND COORDINATION
DELP is structured as a multi-stakeholder network led by NCCU's School of Library and Information Sciences and includes academic, non-profit, and civic partners. Regular meetings and newsletters facilitated collaboration.

Flexibility in governance enabled partners to tailor actives to their constituents. Notably, Kramden Institute, delivered community-based training and laptops, while Momentum offered part-time software engineering training for working adults.

Implementation: Working With Partners

DELP consists of four basic activities: assessment and planning, digital training, community engagement, and evalu ation. Each partner contributed based on their organizational capabilities. Durham Public Schools Foundation (DPSF) offered bilingual literacy classes, often pairing meals and family-oriented formats to improve attendance. Momentum implemented a selective admissions process to support program completion. Six Community Technology Instructors (CTIs) were trained to lead sessions and have Spanish-speaking CTIs for multilingual support.

CHALLENGES AND RESILIENCE

Initial challenges included cybersecurity incidents, leadership transitions, and administrative delays. These hurdles slowed implementation by nearly a year but were addresses through no-cost extensions, adaptive planning, and strong inner-organizational collaboration. For example, Durham Public Library offered physical space for trainings when other venues were unavailable. Feedback mechanisms enabled rapid response and iteration.

Limitations and Future Work

Limitations included small CTI cohorts, unreliable internet access among participants, and initial misalignment of partner goals. Administrative delays in contact processing also impacted timelines. Future phases of DELP will focus on longitudinal outcome tracking, deeper curriculum integration, and broader recruitment of multilingual instructors. Building sustainable infrastructure and aligning with Durham's citywide Digital Equity Plan remain strategic priorities.

IMPACT ON MARGINALIZED COMMUNITIES

DELP and its partners provided digital literacy training to nearly 600 community members, including significant participation from Black and Hispanic populations. Participants gained skills in device use, internet safety, and online job searching, improving individual employability and family engagement in education. DPSF provided digital literacy training to parents and caregivers, offered in English and Spanish languages (Cruz, 2021). Kramden Institute provided digital literacy training focusing on basic digital literacy. Kramden provided two-day Digital CTI training classes and Momentum provided a full-stack engineering class providing enhanced skills to enter the tech industry.

Best Practices

Effective digital empowerment programs prioritize community-centered design by reflecting the cultural and practical realities of those they serve. They leverage multi-stakeholder collaboration to enhance reach and resilience, while ensuring scalability and sustainability through alignment with long-term funding and infrastructure. Continuous learning through feedback loops enables timely adaptation, and pairing digital literacy with technical support ensures meaningful engagement. Lastly, policy advocacy is essential to driving lasting, systematic change.

CONCLUSION

DELP worked with Durham community organizations to curate program ideas that benefited NCCU's surrounding community. By collaborating with program partners, each group was able to evaluate its strengths and provide solutions that best meet the needs of the community by utilizing program partners (Benton Institute for Broadband and Society, 2021). DELP offers a repeatable and equity-based model for digital inclusion. DELP continues to evolve as a cornerstone in the battle for digital justice by bringing together institutions, non-profits, and communities around a common goal. Future efforts will expand its impact through policy alignment, curriculum innovation, and community-led research. The DELP experience shows that closing the digital gap takes more than handing out devices. It needs teamwork, flexibility, and approaches tailored to various cultures.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author: methodology, data curation, formal analysis, writing – original and final draft; Second Author: conceptualization, formal analysis, visualization, writing – review and editing; Third Author: project administration, funding acquisition, supervision, writing – review and editing.

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We owe huge thanks to the program partners, community supporters, graduate assistants, faculty, and staff who made DELP impactful and successful. Your teamwork and drive to promote digital empowerment have expanded

DELP's reach and strengthened its mission to help underserved communities. None of this could have happened without your effort, determination, and strong support.

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Expanding AI Literacy at an HBCU: The Launch and Impact of the NCCU Institute for Artificial Intelligence and Emerging Research (IAIER)

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ABSTRACT
This paper describes the founding, mission, and early outcomes of the North Carolina Central University (NCCU) ce nter for Artificial Intelligence and Emerging Research (IAIER), the first Artificial Intelligence (AI) research center e stablished at a Historically Black College or University (HBCU). Established in January 2025 with $ million in support from Google.org, IAIER represents a bold commitment to equitable AI literacy, ethical research, and community engagement. We describe programming development, such as Soaring Conversations and seed grants, share survey results from pilot learning sessions, and reflect on participant growth in understanding their interest in AI tools. This initiative models how underrepresented institutions can lead national conversations about AI through inclusive, human-centered practices.

KEYWORDS
AI Literacy; HBCU; Human-Centered AI; Community Engagement; Ethical AI; Interdisciplinary Education; Emerging Technologies

INTRODUCTION
AI is reshaping society, however many institutions, particularly HBCUs and Minority Serving Institutions (MSIs), have historically lacked the dedicated infrastructure to support AI learning, exploration, and dialogue (Riggs, 2025). In response, NCCU established the IAIER in January 2025. Funded by a $1 million award from Google.org, IAIER is the first AI institute at an HBCU and serves as a national model for democratizing access to AI. IAIER was established with three core goals: to advance AI literacy among students, faculty, and the public; to foster interdisciplinary research that aligns with ethical and societal needs; and to expand access to emerging technologies for historically marginalized communities. IAIER models how inclusive, ethical AI ecosystems can be developed in underrepresented settings. The creation of IAIER underscores a rising desire to prioritize voices in AI's ethical development and use (Huriye, 2023).

THEORETICAL FRAMEWORK
IAIER is grounded in critical information literacy and dialogic teaching. These frameworks consider AI a sociotechnical space where power, language, and community values intersect. Building on community practice theory, IAIER centers collaborative learning and equity, situating AI literacy within real-world social contexts. By integrating literature on participatory AI and inclusive learning environments, the institute promotes AI exploration that is reflective, critical, and community engaged. Builds its projects using ideas from dialogic teaching and critical information literacy. Equitable AI-powered educational systems must prioritize the needs of historically marginalized learners (Viberg, 2024), which directly informs IAIER's structure and programming. This view focuses on people and helps create spaces where students work together to build knowledge and think about what tech means. Work by Fournier et al. illustrates how communities of practice foster collaborative learning, suggesting knowledge construction is rooted in social interactions and context (Fournier et al., 2021). This aligns with the IAIER perspective that places individual and community knowledge at the forefront of technology-based learning.

PROGRAMMATIC HIGHLIGHTS
Institutional Programming: Laying the Foundation for AI Literacy
IAIER blends research, open discussions, and creative testing in its programs to approach AI learning from different angles. The value of open dialogue and the collaborative nature of learning spaces, as espoused by Salas-Pilco et al., emphasize the role of information and communication technologies (ICT) in bridging knowledge gaps within marginalized communities (Salas-Pilco et al., 2022).

Soaring Conversations: Dialogic Lunch-and-Learn Series
IAIER introduced Soaring Conversations as one of its key initial programs. This monthly hybrid lunch-and-learn series focuses on critical information literacy and dialogic teaching methods. The program aims to engage people in discussing how AI affects ethics, society, and work environments. The Soaring Conversations series featured speakers from organizations such as OpenAI, Dell, FICO, and interdisciplinary faculty across NCCU. These seminars covered important issues like generative AI, misinformation, algorithmic bias, and career paths in

technology. The audience included undergraduate and graduate students, faculty, staff, and members of the local community. The sessions were presented in a hybrid format, combining in-person and virtual conversation to foster inclusive and accessible dialogue.

AI Literacy Labs Using Generative Tools

IAIER provided structured AI Literacy Labs to help different participants understand generative AI techniques and g ain hands-on experience. These sessions combined faculty-led demonstrations with opportunities for individual exploration, allowing attendees to apply AI tools in real-time. Participants engaged with platforms such as GrammarlyGO and Anthropic Claude to better understand how generative AI functions and how it can support academic, professional, and creative workflows. As Martin et al. (2020) observed, integrating emerging educational technologies creates tailored learning environments that accommodate varied academic backgrounds, which is a central approach to IAIER's inclusive pedagogy.

Seed Grant Program for Responsible AI Exploration

IAIER's internal Seed Grant Program supports early-stage AI projects across disciplines. Awards emphasize innovation, ethics, and community relevance, with sponsored projects ranging from civic tech applications to AI-in-the-arts activities. This endeavor is consistent with the findings of Hassan et al., who emphasize the importance of participatory AI in promoting community engagement and public participation in AI development (Hassan et al., 2024). This promotes a school culture of experimentation and prudent research.

Participant Outcomes: Findings from Pre/Post Surveys

GrammarlyGO Sessions

Participants in the GrammarlyGo seminars looked at how the tool could help them improve their academic and professional writing. Following the training, all reported feeling more confidence in utilizing AI tools, with around 83% noticing greater clarity, tone, or structure. The faculty has underlined the tool's efficacy in teaching revision processes and facilitating the writing process.

- Qualitative Reflections:
  - **"I did not know AI could help me think through my ideas – this helped me organize better."**
  - **"It's a great tool, especially for students struggling with tone or transitions."**

Claude/Anthropic Sessions

To gain a deeper understanding of Anthropic Claude's language generating skills, participants created prompts and analyzed the AI's responses. Following the lessons, 96% expressed a better knowledge of how AI generates responses, and many displayed improved critical thinking skills when evaluating outcomes. Students also investigated actual academic applications, such as creating study aids and brainstorming ideas.

- Qualitative Reflections:
  - **"It was surprising how helpful this was for brainstorming."**
  - **"Now I feel like I can use AI without feeling like I'm cheating."**

Seed Grant Program for Responsible AI Exploration

IAIER's internal Seed Grant Program supports early-stage AI projects across disciplines. Awards highlight invention, moral values, and importance to the community, supporting projects like civic tech tools and AI projects in the arts. This builds an environment on campus that values trying new things and doing research.

IMPLICATIONS AND BROADER IMPACT

IAIER at NCCU offers a replicable model for how underrepresented institutions can lead in shaping AI futures. With inclusive programming, interdisciplinary engagement, and measurable literacy gains, IAIER is building an AI-literate campus and community while modeling ethical, equitable innovation. This approach mirrors broader recommendations in the AI ethics community that advocate for direct community involvement in shaping AI systems in the context of equitable health and technology design (Hendricks-Sturrup, 2023). Future work will explore long-term participant outcomes, support curricular integration, and expand institutional partnerships.

CONCLUSION

IAIER at NCCU offers a replicable model for how underrepresented institutions can lead in shaping AI futures. With inclusive programming, interdisciplinary engagement, and measurable literacy gains, IAIER is building an AI-literate campus and community while modeling ethical, equitable innovation. Future work will explore long-term participant outcomes, support curricular integration, and expand institutional partnerships. IAIERs mission to democratize AI access and education aligns with global calls to harness AI for social good (Tomasev et al., 2020).

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author: methodology, data curation, formal analysis, writing – original and final draft; Second Author: conceptualization, formal analysis, visualization, writing – review and editing; Third Author: project administration, funding acquisition, supervision, writing – review and editing.

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Quantifying Urban Change Across US Cities Using the 1930s Redlining Maps: A Preliminary Study

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ABSTRACT
A wide range of studies has explored historical events and their long-term impacts, with urban redevelopment, particularly in the contexts of urban renewal, gentrification, and redlining. However, despite extensive attention to their causes and consequences, quantifying the degree of urban changes over time remains challenging, as scanned historical maps often contain visual noise and annotations. While some computational methods have been developed to model street networks to operationalize urban structures, they are often limited in applying historical maps due to noise. This study proposes a computational method to measure urban transformation by comparing contemporary road structures with those from historical maps. Using 1930s redlining maps as a case study, we extract road features and quantify their structural changes over time. Our results shed light on studies about urban transformation and redevelopment, aiding researchers and policymakers in understanding the impact of historical policies.

KEYWORDS
Historical maps, road structure, urban redevelopment, computer vision, large language model

INTRODUCTION
Redlining, a discriminatory urban planning policy implemented in the 1930s by the Home Owners' Loan Corporation (HOLC), has become an important subject for understanding the long-term impacts of structural racism in American cities. The redlining policy mapped residential neighborhoods with grades, ranging from "A" (best) to "D" (hazardous), based on race, socioeconomic status, and perceived investment risk (Aaronson et al., 2021). In recent years, these maps have been studied both in terms of the policy itself (Hillier, 2023; Geer, 2013) and by linking historical redlining to present disparities in health outcomes (Wei et al., 2024), environmental exposure (Collins & Grineski, 2025), and economic impact (Aaronson et al., 2021). While these studies have leveraged historical documents to trace the enduring social and economic legacies of redlining (Michney, 2019; Biggs et al., 2023), understanding how urban landscapes have changed over time is challenging due to the nature of historical maps and the complexity of urban infrastructures. Historical maps are often preserved only as scanned images or physical copies (Blanke et al., 2012), which lack standardized structures, include additional annotations, and are not machine-readable, posing challenges for computational analysis. As a result, there remains a critical gap in our understanding of how, and to what extent, the spatial configuration of geographical regions (Boeing, 2019) has been inherited or transformed over decades. Thus, we ask the following research question:

RQ: How can we accurately measure the degree of urban changes over time based on historical maps?

To address this challenge, this study provides an initial assessment of a computational method that leverages computer vision (CV) and large language models (LLMs) to extract spatial features from historical redlining maps and quantify the change of urban structures. Using CV and LLM, we digitized 1930s HOLC maps and quantified the degree of cities' structural transformation over the decades. This approach contributes to the growing fields of computational archival science, community informatics, and computational urban sociology, offering a new pathway to understand the varying impacts of redevelopment policies across cities.

METHODS
Georeferenced historical redlining maps were downloaded from the Mapping Inequality website (Nelson et al., 2020). To provide an initial assessment of the approach, we selected 21 cities where redlined zones were not heavily segregated and contemporary populations were evenly distributed. We used the changes in their road structures as a proxy to assess the degree of urban changes. Using OpenAI's image model, `gpt-image-1`, we first extracted the road network of historical maps as images. Contemporary road networks were extracted using QGIS from open shapefiles. The road layers for each city were exported as both georeferenced raster images and vector images, and aligned to match the spatial extent of the corresponding historical map using the AdaBoost algorithm (Schapire, 2013). To measure the differences, we used structural similarity index measure (SSIM) for the vectorized images and pixel-wise overlap for raster images measured using the Intersection over Union (IoU). For both measures, 0 means no similarity at all (i.e., complete changes), and 1 means a perfect match between two images (i.e., no changes). We validated the results with our qualitative assessment of urban differences. We manually generated (noisy) ground truths about how much each city changed over the decades by classifying the degree of change in each pair of maps as "significant," "moderate," and "minimal." Then, we assessed the performance of the measures

by comparing it to the ground truths through regression analysis (treating minimal=1, moderate=2, and significant=3).

Region	IoU	SSIM	Ground truths
AZ_Phoenix	0.936	0.504	Minimal
CA_Fresno	0.045	0.001	Significant
CA_Oakland	0.059	0.002	Moderate
CA_Sacramento	0.080	0.001	Significant
CA_Stockton	0.936	0.499	Moderate
CO_Boulder	0.044	0.002	Moderate
CO_Pueblo	0.068	0.001	Significant
CO_Greeley	0.077	0.000	Minimal
MA_Boston	0.097	0.002	Significant
MA_Salem	0.033	0.001	Significant
ME_Augusta	0.977	0.643	Minimal
ME_Portland	0.951	0.445	Moderate
ME_Sanford	0.956	0.654	Minimal
ME_Waterville	0.028	0.001	Significant
UT_Ogden	0.066	0.002	Significant
VT_Bennington	0.961	0.617	Minimal
VT_Springfield	0.032	0.000	Significant
WA_Seattle	0.104	0.001	Minimal
WA_Spokane	0.893	0.393	Minimal

Table 1. Comparisons of measures for the 21 cities

Figure 1. Road structures from the Redlining Map (left) and OpenStreetMap (right) in Seattle, WA

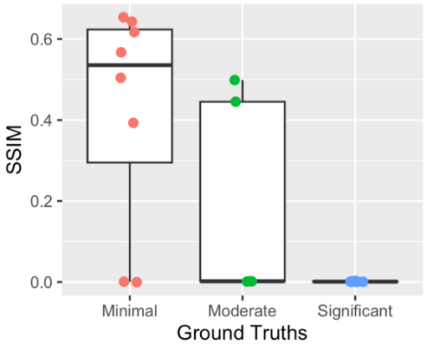

Figure 2. Ground Truths vs. SSIM

PRELIMINARY RESULTS

Table 1 reports similarity metrics between historical and contemporary road networks for the 21 U.S. cities. The mean IoU for the pixel-wise overlap is 0.398 (SD=0.443) and that for SSIM is 0.207 (SD=0.274). The linear regression analysis between the ground truths and each measure showed that both IoU and SSIM scores are negatively associated with the ground truths (β_{iou}=-1.39, p_{iou}<0.001; β_{SSIM}=-2.24, p_{SSIM}<0.001), confirming the efficacy of this approach. Between them, SSIM presented a slightly higher association with the ground truths. Given that lower SSIM scores indicate greater urban structural changes between historical and contemporary road networks, cities with lower SSIM values have undergone more significant physical structural change.

DISCUSSION AND FUTURE WORK

Our preliminary assessment of image-based comparison between historical and modern maps' road structures shows that CV-based methods could be useful in quantifying the degree of urban structural changes or transformation. Information scientists, urban studies researchers, and sociologists who study the long-term effects of historical impact on urban dynamics can benefit from our approach by measuring the varying degree of redevelopment across the cities in the United States. While this study provides a useful approach to process historical maps and measure the degree of changes, it needs further improvements. First, we tested only AdaBoost-based alignment and image comparison methods based on their vector-based and raster image-based overlaps. Future studies can benefit further by testing a wider range of CV- and network-based similarity algorithms, such as texture-based and topology-based features. Second, road extraction methods from historical maps are solely based on LLMs in our study; however, the performance of the road extraction algorithms need to be improved by either tuning AI models or using advanced CV techniques. Third, we used only road structures as a proxy to measure the urban structural changes. However, the extent of urban redevelopment or structural change depends not only on road networks but also on the diversity of amenities, populations, and other infrastructures. Lastly, ground truths were tagged by a single coder in a qualitative manner; future analyses will need to incorporate multiple coders to ensure inter-rater reliability or develop more systematic methods to generate ground truths. By ensuring the robustness and accuracy of the urban change measures, CV- or AI-based approaches for quantifying urban structural change will better support research about the historical impacts of urban dynamics.

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AUTHOR ATTRIBUTION

Gie Myung Lee: writing – original draft, methodology, visualization, formal analysis; Myeong Lee: conceptualization, supervision, validation, oversight, writing – review & editing, project administration, funding acquisition.

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How Artists Translate Image Needs on Social Media: Preliminary Analysis of Interaction

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ABSTRACT

Articulating the need for an image can be challenging, as describing an image is more subjective than conveying textual information. This poster investigates how 19 visual artists articulate and accomplish their image needs while searching on social networking sites (SNSs), using data from observations and interviews. The findings revealed five types of image needs and five types of queries employed by visual artists. A unique query type identified on SNSs is the Ideation-oriented query, which explicitly asks for ideas in the search field for inspiration, direct use, or modification in their creative process. The poster highlights the artists' needs in their natural settings and how they attempt to communicate with an AI-mediated environment to retrieve images using natural language.

KEYWORDS

Image searching behavior, social networking sites, artists, image needs, information needs, query formulation

INTRODUCTION AND BACKGROUND

Today's information environment has become more abundant, encompassing traditional and digital media, as well as user-generated content and Artificial Intelligence (AI)-generated information. The evolution of the environment has changed not only how people seek and encounter information but also how artists discover and publish their artworks (Hemsley & Keylly, 2019; Naskova, 2016). Moreover, the development of AI has enabled artists to co-create their visions by communicating directly with it (Cetinic & She, 2022), which potentially bypasses the need to search for images on various platforms. However, a communication gap persists between AI-mediated information environments and artists, particularly in terms of understanding the artists' needs and intentions. To better guide an AI-mediated information environment in understanding artists' needs, this poster examines how visual artists express their image needs on social media during their creative tasks.

Earlier studies on image needs have been closely examined in settings such as archives or library collections, investigating image needs to improve image indexing (Armitage & Enser, 1997; Choi & Rasmussen, 2003; Jörgensen, 1998; Ornager, 1995). Therefore, diverse archives or libraries with photographic, still, or moving images were observed to analyze different image requests from their users (Armitage & Enser, 1997, Enser & McGregor, 1992,Keister, 1994. Recent studies have started to investigate image needs and behaviors on the web and social media settings (Huang & Kelly, 2013; Hussain et al., 2022; Yoon & Chung, 2011). Moreover, query formulation and reformulation have been examined to understand users' needs and behavior (Choi, 2013; Jörgensen & Jörgensen, 2005; Kumpulainen & Ruotsalainen, 2022; Park et al., 2015). While prior studies have focused on students or the academic setting, less attention has been given to professional artists engaged in creative works. This poster addresses the following research questions:

RQ1. What types of image needs do artists have when searching on social networking sites (SNSs)?
RQ2. What types of search queries do artists use to represent their image needs when searching on social networking sites (SNSs)?

METHODOLOGY

This study employed three data collection methods: questionnaires, observations with think-aloud protocols, and interviews. Participants were eligible if they were at least 18 years old, had at least three years of experience using SNS, had experience with commissioned work, and were currently engaged in a creative project that involved searching for images on SNSs. In this study, a visual artist refers to an individual who practices either fine or applied art, employing various media to create or design visual works (Cobbledick, 1996; Dane, 1987; Layne, 1994). The recruitment flyer was distributed on various social media platforms, followed by snowball sampling. For the observation, the participants were asked to describe their creative project and the associated image search tasks. In the semi-structured interview, they were asked about their image search behaviors, SNS usage, and challenges encountered when searching for images on SNSs. Each session lasted between 30 and 120 minutes and was conducted via Microsoft Teams. The data consisted of observations, think-aloud data, and semi-structured interviews with 19 participants. The recorded and transcribed observations and interviews were open coded in NVivo to identify types of image needs and search queries used by artists using SNSs.

FINDINGS

A total of 150 queries were identified during the image-searching tasks. The participants conducted one to two search tasks depending on their creative project. The initial analysis revealed five types of image needs and five types of queries (Table 1). Among the five types of image needs, Visual or stylistic needs (n=67, 44.7%) were the

most frequently expressed needs from the participants for their creative tasks, followed by Content or object needs (n=45, 30.0%) and Conceptual needs (n=25, 17.3%). Some participants had visualized aesthetics and tried to find images that portrayed what they had envisioned, such as color tone, palettes, style, or effects. For example, S1, whose creative task was to design a Connel box, explained his initial thought on the Cornell box design, which changed as he progressed with his search: *"…image that I was looking for before was more focusing on what's the Cornell box in general composition and general mood…I think I like certain style and certain mood. So, I like to add lighting specific lighting with the composition..."*

Of the five types of queries, Content-oriented queries (n = 55, 36.7%) and Technique/style-oriented queries (n = 35, 23.3%) account for the majority of the query types used by participants to express their image needs. The participants utilized general or specific object terms or terms to describe a scene to articulate their needs, such as "*pride and prejudice 2005*," "*balloon with nail*," and "*productivity app*." Moreover, terms refer to a specific color, color grading, or technique to meet their needs, such as "*Mauve pink*," "*…parting lines*," and "*…exploded view*."

Types of image needs	**Definition**	**N (%)**
Affective	Need for an image that conveys emotional expression	2 (1.3)
Conceptual	Need for an image that represents an idea, a theme, or a meaning	26 (17.3)
Content or object	Need for an image that contains an item, a person, or an entity	45 (30.0)
Situation	Need for an image that depicts a state, a condition, or a story	10 (6.67)
Visual or stylistic	Need for an image that depicts a specific aesthetics or composition	67 (44.7)
Types of queries	**Definition**	
Conceptual-oriented	A query focusing on describing abstract concepts or themes	30 (20)
Content-oriented	A query focusing on nameable objects, topics, or scenes	55 (36.7)
Ideation-oriented	A query requesting ideas on SNS	6 (4.0)
Medium-oriented	A query focusing on materials, format, or visual product method	24 (16.0)
Technique/style-oriented	A query focusing on artists' choice of expression, such as color, color grading, composition, or aesthetics	35 (23.3)

Table 1. Types of image needs and queries

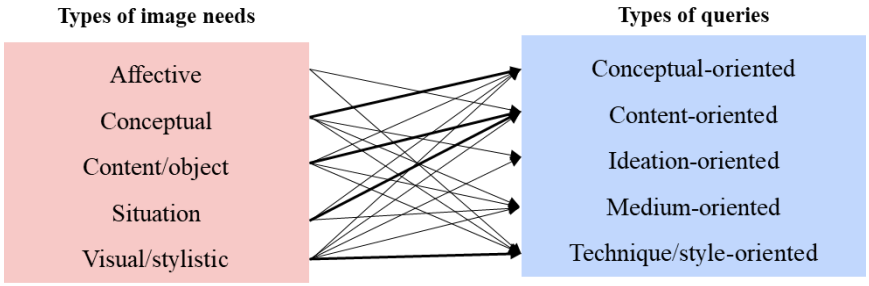

Figure 1. Visual artists' translation of needs into queries

Visual or stylistic needs, unlike other types, have been expressed through all five types of queries (Figure 1). This result suggests that participants may have specific visuals or styles in mind; however, they employ various mechanisms to express these needs, ultimately finding images that satisfy them. Additionally, some participants begin with a broad idea and refine their ideas as the search process inspires them: "*[Typed "travel film color grading"] … I sort of have an idea that I wanna go like with warmer tones… I don't think I wanna go, like, super intense and Moody…. [Typed "soft travel film color grading"] I think maybe if I went for like softer color…*" (S10).

CONCLUSION AND DISCUSSION

This poster aims to identify the various image needs and queries of artists seeking images for their creative tasks. Through preliminary analysis, this poster presents five types of image needs and five types of queries. In line with the previous findings, participants interpret their image needs the majority of their needs into Content-oriented, Technique/style-oriented, and Conceptual-oriented query types, which include terms representing specific or general things or individuals, geographical elements, concepts, and visual elements (Choi & Rasmussen, 2003; Jörgensen & Jörgensen, 2005; Keister, 1994). Unique to the social media setting, the findings revealed that participants incorporate Ideation-oriented queries to address four distinct types of needs. Furthermore, for Visual or stylistic needs, artists use diverse types of queries to transform their mental images into searchable terms. This process supports SNS algorithms in interpreting their creative vision. Based on the findings, the artists are interested in finding specific aesthetics or styles on social media, but they utilize a range of methods to communicate their vision to the systems. This underscores the need for improvement in capturing subtle style differences or similarities to

enhance their interaction with these systems. Therefore, incorporating these types can enable systems to more efficiently tailor image retrieval to match artists' specific images needs.

GENERATIVE AI USE

I employed ChatGPT4.0 for the following purpose(s): Proofread for grammatical errors. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

First Author: conceptualization, methodology, investigation, formal analysis, writing – original draft, review and editing.

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Role Shifts and Engagement Patterns in an Ovarian Cancer Online Health Community

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ABSTRACT
This study explores how ovarian cancer (OvCa) patients and caregivers engage with online health communities (OHCs), offering insights to address the cold-start problem in health recommender systems. Analyzing 909 initial posts and 14,816 comments from the National Ovarian Cancer Coalition (NOCC) forum, we examined how users' contributions evolve over time. Initial interactions typically center on emotional support and personal experience sharing, while more advanced engagement, such as advice and referrals, emerge later as users gain more domain knowledge. We introduce a novel "start position" metric to identify when users begin providing each support type. Our results reveal distinct progression patterns and emphasize the importance of dynamic user modeling to reflect users' evolving knowledge and roles. These findings inform the design of OvCa-specific recommender system, which our team develops with support of the National Library of Medicine.

KEYWORDS
Ovarian cancer; Online health communities; Health recommender systems; Information needs

INTRODUCTION
Ovarian cancer (OvCa) is a complex disease characterized by multiple tumor subtypes and diverse prognoses, necessitating personalized treatment strategies and evolving information needs (National Cancer Institute, n.d.; Reid et al., 2021). In response, many patients turn to disease-specific online health communities (OHCs) to seek guidance and share experiences with others facing similar journeys (Ahuja & Shree, 2025). When joining these communities, patients and caregivers often introduce themselves through an initial post that explains their motivation for joining and the type of support they seek (Sillence, 2010). These initial posts frequently prompt discussions, followed by a series of time-ordered replies from other community members. Compared to later interactions, initial posts and their immediate responses tend to offer more substantive insight into users' needs and the forms of support exchanged. This study is part of the HELPeR (Health E-Librarian with Personalized Recommendations) project, developing a health recommender system (HRS) delivering accurate, personalized information to OvCa patients and caregivers based on individual needs and relevance. One key challenge in building such systems is the cold-start problem, which occurs when there is insufficient user data to generate personalized recommendations (Moghaddam & Elahi, 2019). Thus, we aimed to analyze initial posts from the OHC to better understand users' motivations for joining. These insights help identify early-stage information needs, which can inform the design of effective HRS.

METHODS
Data Collection
The National Ovarian Cancer Coalition (NOCC) forum is designed to support OvCa survivors and caregivers. We collected data from June 2010 to December 2020, comprising 909 initial posts and 14,816 comments across threads that each included an initial post followed by a series of replies. As the forum is private, we have obtained approval from the institutional review board (IRB) to access its content.

Analysis
To analyze the diverse forms of support, we began by hand-annotating 500 selected posts and comments pairs from the NOCC dataset, as the full manual review was infeasible. This process, detailed in prior work, established a ground truth dataset for training machine learning classifiers (Chi et al., 2022). Using this annotated subset, we developed classifiers to automatically categorize support types across the entire collected data set. These classifiers categorized four support types: Advice (suggestions or recommendations for action), Referral (guidance to external resources or individuals), Personal Experience (sharing lived experiences related to OvCa), and Emotional Support (comfort, encouragement, and empathy). Each post and comment pair were then labeled with its support type, timestamp, and user ID, enabling reconstruction of each user's chronological posting history. We introduced a novel metric, "start position," defined as the n*th* post or comment in which a user first provided a given type of support, recognizing that both posts and comments can serve as channels for offering support to others. For instance, if a

user's first instance of giving advice occurred in their 10th post, the start position for "advice" was 10. This metric serves as a proxy for identifying when users shift from initial, experience-based contributions to more advanced forms of support requiring greater knowledge, such as advice or referrals.

RESULTS

Figure 1 illustrates a clear pattern in how users' contributions evolve over time within the NOCC forum. In the early stages of their posting history, users predominantly engaged in simpler forms of interaction, such as sharing personal experiences and offering emotional support. These support types appear earlier along the "Post Number (Start Position)" axis, indicating that users tend to provide them soon after joining the forum. As users gain more experience and familiarity with the forum, their contributions shift toward more complex forms of support. Advice and referrals, support types that typically require greater domain knowledge, appear later along the axis, suggesting they are offered only after users have accumulated more knowledge and confidence. This progression reflects a broader shift in user behavior, from sharing personal narratives or emotional encouragement to offering informed guidance and resource referrals. The transition implies that continued participation in the forum may foster both learning and a sense of empowerment among users. However, the variation observed within certain categories, especially referrals, points to substantial individual differences in user trajectories. While some users quickly assume knowledge-sharing roles, others remain in earlier phases of interaction (e.g., emotional or experiential support) for extended periods.

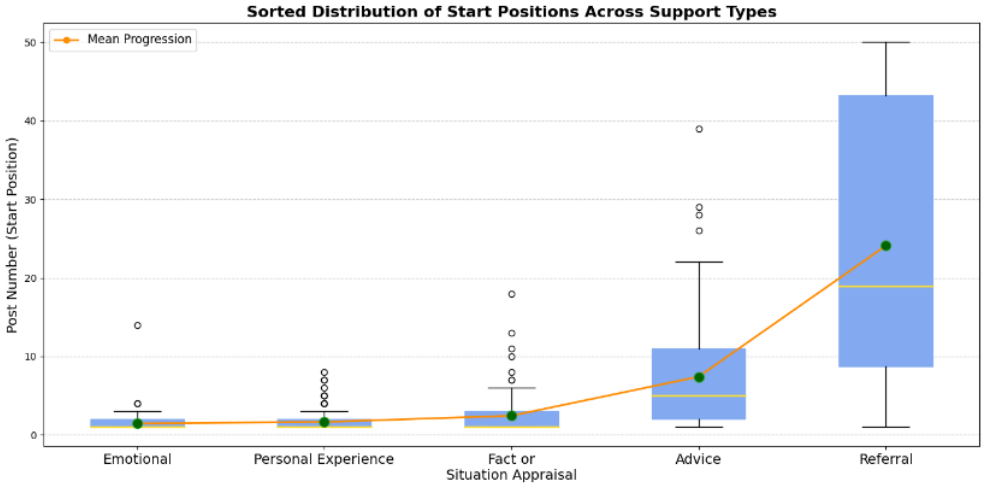

Figure 1. Pattern in the evolution of users' contributions over time within the NOCC forum

DISCUSSION AND CONCLUSION

Our findings reveal a clear trajectory in how users engage with the NOCC forum, beginning with emotional support and personal storytelling, and gradually progressing to more complex forms of engagement such as offering advice and referrals. These early interactions help establish trust and connection, laying the groundwork for deeper participation. The pace at which users move through this trajectory varies, highlighting the need for personalized support strategies within health-related systems. These insights inform the design of the HELPeR system in two ways. First, users typically lack in-depth knowledge about ovarian cancer during their initial forum interactions. As they accumulate lived experience, they gain the ability to contribute more substantive informational support. This underscores the importance of dynamically modeling user knowledge over time to ensure that recommended content aligns with each user's current level of understanding. Second, the analysis demonstrates that more experienced users often prefer to search for information independently, rather than rely solely on system-generated recommendations. Therefore, HELPeR should support both passive content delivery and active search functionalities. By accounting for individual learning curves and engagement styles, the system can provide more relevant, flexible, and user-centered support throughout a patient's journey.

GENERATIVE AI USE

Portions of this abstract, including language refinement and editing, were assisted by generative AI (ChatGPT, OpenAI). All content was critically reviewed and finalized by the authors to ensure accuracy and originality.

AUTHOR ATTRIBUTION

YJL: conceptualization, writing–original draft, funding acquisition, supervision; KT: data curation, formal analysis, visualization, writing–review and editing; YW: writing–review and editing; VH: data curation, writing–review and editing, HD: validation, writing–review and editing; DH: conceptualization, funding acquisition, supervision, writing–review and editing; PB: conceptualization, supervision, writing–review and editing

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Effectiveness of GenAI-driven Personalised Nudges in Reducing Procrastination Among Students

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ABSTRACT
This study examines the effectiveness of generative AI-driven personalised nudges in reducing students' procrastination during informal learning, involving thirty-five participants in a 14-day diary study. Nudges, delivered as notification messages via the mobile application, were triggered based on generative AI analysis of participants' routine activities to encourage their learning. The pre- and post-intervention measures were administered to assess the outcomes of the nudging intervention. Results show significant differences between pre- and post-intervention, suggesting the positive influence of nudges and their supporting role in participants' learning. The findings provide insights into how integrating generative AI-driven personalised nudges into digital environments has the potential to transform the learning experience and enhance the effectiveness of these nudges.

KEYWORDS
Digital Nudge, Personalised Nudge, Generative Artificial Intelligence, Procrastination, Human-AI Interaction

INTRODUCTION
The concept of nudging has gained considerable attention in the educational domain due to its potential to influence students' learning behaviours (Damgaard & Nielsen, 2018; Thaler & Sunstein, 2008), particularly in reducing procrastination and improving learning outcomes (Lim & Lee, 2022; Plak et al., 2022). Central to the effectiveness of these nudges is the personalisation of nudges (Mills, 2022), designed to influence individuals' behaviour based on their preferences or particular circumstances (Mills, 2022). The domain of human-computer interaction aptly provides the methodologies to guide the design of individualised interventions (Jesse & Jannach, 2021). Insights into students' learning behaviours, motivational factors, and procrastination patterns can be gained by harnessing data from various sources, such as learning management systems and behavioural tracking tools (Dalecke & Karlsen, 2020). This data is analysed to derive the most suitable approaches for delivering nudges and ensuring their impact on students' behavioural outcomes (Dalecke & Karlsen, 2020). Previous studies have shown that personalised nudges can significantly improve students' learning outcomes by offering contextually appropriate interventions that resonate with diverse student profiles (O'Connell & Lang, 2018; Smith et al., 2018).

The advancements in artificial intelligence (AI) technologies, specifically generative AI (GenAI), and their integration with nudges open new opportunities for creating highly personalised and adaptive interventions that respond to individual behaviours and learning patterns (GovTech Singapore, 2025, January 21; Milberg, 2024, April 28). Although the application of GenAI in education has been widely discussed, GenAI-driven nudges aimed at reducing student procrastination remain an under-explored area of research. This gap highlights the need for a systematic investigation into how GenAI-driven nudges can be utilised to improve learning behaviours. Therefore, this study aims to address the gap by investigating the efficacy of GenAI-driven personalised nudges to reduce students' procrastination behaviours through a 14-day diary study. The nudges, generated by GenAI analysing students' contexts and preferences, were delivered as personalised notifications and contextual learning advice to the students via a mobile application (app) designed and developed by the authors. The findings from this study could reshape learning experiences, providing students with the tools they need to overcome procrastination and achieve positive learning outcomes.

METHOD AND RESULTS
A 14-day diary study, approved by the Institutional Review Board (IRB-2024-561), was conducted between November 2024 and March 2025 at a local university. Participants were recruited via email and messaging channels and invited to join the study after assessing their suitability. Specifically, postgraduate students were selected due to their higher levels of academic autonomy and increased susceptibility to procrastination, which they often associated with exposure to more self-regulated tasks, making them a relevant group for evaluation (Liu et al., 2020). Additionally, participants were required to install a mobile app on their devices for the study. The development of mobile-based GenAI-driven nudges was guided by the principles of nudges (Thaler & Sunstein, 2008) and the guidelines for nudging in education to minimise potential side effects, such as inducing undesirable or unwanted learning behaviours in students (Weijers et al., 2021). Potential GenAI biases were mitigated by testing the input prompts and verifying that the generated output was coherent and reliable within the learning context (Marvin et al., 2024). The GenAI would analyse participants' contexts and preferences, such as sleeping, dinner and school time, and recommend the most suitable time among students' activities to trigger the nudging intervention, encouraging participants to initiate their informal learning. Participants would receive the nudges via notification messages on

their mobile devices. In addition, the GenAI would generate personalised contextual content to encourage and advise participants towards their learning (Figure 1). Please refer to Figure 2 for the overview of the nudging processes.

"*Try to dedicate at least 30 minutes a day to informal online learning during your free time. This could be while you're eating dinner or before you go to bed. Consistency is key, so make it a habit to continue learning even during your busy schedule*." (ChatGPT, Oct 22, 2024)

Figure 1. Example of personalised contextual content

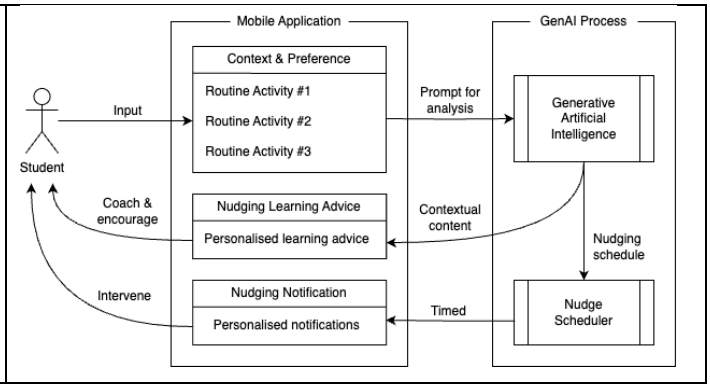

Figure 2. Overview of GenAI-driven Personalised Nudging Processes

The study comprised three phases. In the pre-intervention phase, participants completed the 16-item Tuckman Procrastination Scale (TPS; Tuckman, 1991). During the 14-day intervention phase, participants received and responded to a total of three personalised nudges by initiating the informal learning tasks. Lastly, during the post-intervention phase, participants completed the TPS and the 17-item Technology Acceptance Model (Davis, 1989), and were compensated $50 SGD for their time and effort. A normality test was conducted on the collected data, followed by the appropriate t-test to evaluate the mean differences between the pre- and post-intervention periods.

A total of 42 participants were recruited, but only 35, aged between 22 and 50 years (M = 29.2, SD = 6.650), completed the study. Among them, 31.4% (n = 11) identified as male, and 68.6% (n = 24) identified as female. The Shapiro-Wilk test indicated that the data were normally distributed (W = .968, p = .397). A paired samples t-test revealed a significant difference between pre- (M = 3.063, SD = .623) and post-intervention (M = 2.798, SD = .526), $t(34) = 2.068$, p = .046), Cohen's d = .35, suggesting that there was a significant reduction in participants' procrastination tendencies after the intervention. Further analysis revealed that 57% (n = 20; 16 females, 4 males) of participants reported lower procrastination tendency scores in post-intervention compared to their initial responses. In comparison, the remaining 43% (n = 15; 8 females, 7 males) showed no to slight increase in procrastination. Among those who exhibited lower procrastination tendencies (n = 20), 85% (n = 17; 13 females, 4 males) perceived GenAI-driven nudges as helpful and intended to use them in supporting their learning. On the other hand, for those who did not exhibit lower procrastination tendencies after the post-intervention (n = 15), 60% (n = 9; 6 females, 3 males) also reported that GenAI-driven nudges would help support their learning and intent to use it.

DISCUSSION AND CONCLUSION

The primary aim of this study is to demonstrate an innovative application of GenAI-driven personalised nudging to reduce students' procrastination through a 14-day diary study. The findings of this study indicated a notable reduction in procrastination, suggesting that the GenAI-driven personalised nudging strategies were effective. Unlike traditional AI-driven nudging techniques, which often rely on predictive analytics with limited contextual capabilities, GenAI-driven nudges analyse students' context and preferences, such as their routine activities, to provide custom, relevant, and timely interventions that resonate more closely with students' unique preferences, e.g., balancing rest time against academic tasks. This is achieved through generating contextual content to simulate personalised coaching and encouragement, and maximising the impact of nudges by adapting the timing of interventions to students' activities. This approach ensures that the nudges are not only more likely to be noticed by students but also enhances the promotion of positive behavioural changes. Additionally, this study demonstrated the seamless integration of GenAI-driven nudges into students' digital learning environments. Given the prevalence of digital devices that students utilise, GenAI-driven nudges can be delivered directly through these channels, ensuring greater visibility, reach, and impact. This integration streamlines the process for students to receive nudges such as reminders and informational messages, minimising the risk of overlooking or ignoring them.

While the results are promising, the small sample size of 35 postgraduates may limit the generalisability of the findings to a broader population. Additionally, it could be susceptible to potential selection bias, as participants who volunteer may already be more motivated or engaged. Future studies should aim to include a larger and more diverse sample to observe and collect more sustained effects and conduct a more comprehensive assessment of the nudge's effectiveness. Despite this limitation, the preliminary findings of this study contribute to the existing body of knowledge and understanding of the impact of GenAI-driven personalised nudges on students' learning behaviour.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Kok Khiang, Lim: conceptualisation, methodology, data curation, formal analysis, writing – original draft, writing – review and editing; Chei Sian, Lee: supervision, funding acquisition, writing – review and editing.

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Wings, Wires, and Wit: How Avian Metaphors Illuminate Risks in Cybersecurity and Information Technology

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ABSTRACT
This study analyzes two avian metaphors — "Canary in the Coal Mine" and "Pigeon packet"—in cybersecurity discourse. Using Kueffer and Larson's (2014) metaphor criteria, alongside Ritchie's (1999) incongruity theory and Koestler's (1964) concept of bisociation, we examine their factual grounding, rhetorical function, and humor effects. While both rely on incongruity for impact, their effectiveness varies across social and cultural contexts. Findings highlight how metaphor and humor can enhance engagement and risk awareness in cybersecurity communication.

KEYWORDS
metaphor, humor, avian, science communication, cybersecurity

INTRODUCTION
Metaphor and humor play critical roles in science and technology communication. Metaphors simplify complex ideas by linking them to familiar concepts, while humor enhances engagement and, at times, supports persuasion and attitude change (Frank et al., 2025; Lesser et al., 2016; Taylor & Dewsbury, 2018). This study examines two avian metaphors widely used in the cybersecurity community— "Canary in the Coal Mine" and "IP over Avian Carriers" (IPoAC), also known as "Pigeon packet" —with attention to their cultural resonance and communicative function in humorous contexts. The Canary metaphor, derived from its historical role as a toxic gas sentinel in coal mines, symbolizes early-warning systems in cybersecurity (Leech, 2024). Conversely, the Pigeon packet originated as a satirical RFC imagining homing pigeons as data carriers (Waitzman, 1990, 1999), later tested by Johansson et al. (2003) to highlight infrastructural fragility through humor. While metaphors are common in technical discourse, these avian metaphors stand out for their symbolic resonance across cultural, linguistic, and perceptual domains, and effectively evoke the mental image of information and risk as fluid, mobile entities—an effect reflected in their recurring appearances in technical blogs, hacker forums, and science journalism. However, they remain underexamined in scholarly literature, and as partial representations, metaphors and humor risk oversimplifying or distorting meaning if used without contextual care (Frank et al., 2025; Taylor & Dewsbury, 2018; Riesch, 2015). Thus, this study addresses the research question: How are the metaphors "Canary in the Coal Mine" and "Pigeon packet" influence the understanding of technical concepts and the communication of risk? What rhetorical or contextual factors condition their communicative effectiveness?

FRAMEWORKS FOR METAPHOR APPROPRIATENESS AND HUMOR EVALUATION
In order to evaluate and compare the communicative potential of these two humor-laden avian metaphors within cybersecurity discourse, this study adopts two conceptual frameworks. First, we apply Kueffer and Larson's criteria (2014) evaluate metaphors based on factual correctness (accurately representing scientific concepts and adaptability to new discoveries), socially acceptable language (culturally appropriate and non-discriminatory expressions), neutrality (avoiding emotional or ideological bias), and transparency (clearly articulated rationale for metaphor selection and use). Second, insights from incongruity theory (Ritchie, 1999) and Koestler's (1964) notion of bisociation explore how humor emerges from unexpected connections between incongruent conceptual frames, triggering surprise, insight, or laughter. Combining these frameworks enables a more comprehensive analysis by addressing both the normative demands of science communication and the cognitive mechanisms through which humor and irony shape engagement in cybersecurity discourse.

RESULTS
Factual Correctness. Both demonstrate a high degree of factual correctness. The Canary metaphor is rooted in both its historical application and its biological function as a sentinel species. It has been widely employed across diverse domains to serve as early indicators of potential threats or systemic failures (Leech, 2024). The pigeon packet metaphor, though originally derived from a series of humorous internet protocols, has since been substantiated by research teams (Johansson et al., 2023) who demonstrated the feasibility of using pigeons as a medium of communication. Moreover, this use of pigeons is biologically plausible. Scientific studies have shown that homing pigeons exhibit remarkable navigational abilities through the synergistic use of multiple sensory mechanisms,

enabling them to accurately orient themselves and return to their lofts even in complex environments (Mehlhorn & Rehkämper, 2010).

Socially Acceptable language. Although both embody distinct cultural meanings, they are generally regarded as less socially acceptable due to their association with animal use and ethical concerns (Burton, 2014). Leech (2024) indicates that the canaries were not only perceived as warning tools but also regarded as companions in hardship, treated with care and affection. However, this interpretation has been challenged by other scholars. Jaworski (2022) argues that such animal metaphors may obscure the histories of structural violence they are entangled with, thereby legitimizing the symbolic framing of life as disposable. Deckers and Pezzetta (2023) also critique the instrumentalization of pigeons, emphasizing that these birds frequently experience considerable psychological stress and suffering during long-distance flights and intensive training regimens. Owners may even deliberately separate them from their mates, a practice that has drawn criticism for infringing upon the birds' social bonds and natural mating behaviors, to intensify their drive to return.

Neutrality. In contrast to the satirical and critical undertones embedded in pigeon packet metaphor, Canary metaphor conveys a greater degree of neutrality, as it is rooted in historical practice and emphasizes an objective function of early danger detection, rather than reflecting specific value judgments or ideological positions. Further discussion of their satirical implications appears in the section on incongruity and bisociation.

Transparency. Metaphor transparency hinges on cultural familiarity and interpretive clarity for the audience. In Canary metaphor, it is highly dependent on its specific linguistic and cultural context, leading to considerable variability in interpretation. "Canary in the coal mine" has become a widely recognized colloquialism in English-speaking contexts. Whereas its figurative meaning has not been fully disseminated in non-English cultural spheres, such as East Asia. For example, Peng (2023) draws on this metaphor to describe nurses as the "canaries" of the healthcare system, but this application requires additional contextual explanation, suggesting that the metaphor's transparency remains relatively low in certain cultures. By comparison, although the technical origin of pigeon packet metaphor may be unfamiliar to non-expert audiences, the role of carrier pigeons as messengers is widely recognized across many cultures (Jerolmack, 2013). This contributes to a higher transparency compared to Canary.

Incongruity and Bisociation. Both avian metaphors generate humor through incongruity, subverting expectations by juxtaposing contrasting conceptual frames. Drawing on Koestler's notion of bisociation, they bridge the technical with the absurd, inviting reflection through surprise. The Canary metaphor combines category mismatch (bird vs. digital system), temporal disjunction (19th-century mining in modern cybersecurity), and symbolic inversion (passive victim as active detector). These tensions create both conceptual clarity and cultural resonance. In contrast, the Pigeon packet metaphor relies on satirical incongruity. By pairing homing pigeons with high-speed networks and presenting the idea as a formal RFC standard, it employs procedural irony to critique technological assumptions. Echoing Bergson's (1914) view of irony as the clash between "the real and the ideal," this metaphor highlights the fragility of infrastructure while resonating with expert audiences. As Koestler argues, such layered juxtapositions not only amuse but catalyze insight—potentially sparking innovation and deepening engagement with issues of risk and system design.

	Factual accuracy	Socially acceptable language	Neutrality	Transparency	Incongruity and Bisociation
Canary Metaphor	High	Low to Moderate	High	Variable ※1	High
Pigeon Metaphor	High	Low	Low	Variable ※2	High

Table1. Analysis Results Note: ※1 = culture-dependent； ※2 = background-dependent

DISCUSSION AND FUTURE WORKS

This study highlights how both metaphor and humor operate as rhetorical strategies in cybersecurity discourse—shaping digital risk perception, technical engagement, and information literacy. We evaluated the communicative value of the avian metaphors and found that, despite their factual accuracy, their social ambiguity and interpretive opacity may limit their broader relevance. However, these same ambiguities enhance resonance within technically literate subcultures, particularly among cybersecurity practitioners. Emotional responses often outweigh rational analysis, and when humor emerges from structural incongruity, it can enhance message receptivity and perceived credibility (Frank et al., 2025; Van Schaik et al., 2020). Therefore, employing metaphors with ironic undertones in public risk communication may offer a valuable pathway for improving cybersecurity awareness among non-expert audiences. For future work, we suggest further research into the historical and linguistic embedding of such metaphors in technical discourse, as well as empirical investigation into their reception and interpretation across diverse sociotechnical contexts.

GENERATIVE AI USE

We used OpenAI's ChatGPT solely for academic writing, including language refinement, structure clarification, and expression enhancement. The output was reviewed, revised and integrated by the authors to ensure fidelity to the research and academic standards. The authors assume full responsibility for the content of this submission.

AUTHOR ATTRIBUTION

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Aligning Reality Through Tri-RealitY: Reconceptualizing Information Acceptance and Cognitive Alignment

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ABSTRACT
This study proposes the Tri-RealitY framework(TRY), an innovative framework for examining how individuals cognitively interpret and respond to inconsistent or ambiguous information. Integrating incongruity theory, the framework identifies three dimensions influencing how individuals cognitively interpret information: *General Reality* (grounded in common knowledge), *Contextual Reality* (guided by situational cues), and *Ideological Reality* (shaped by personal beliefs and social identities). We argued that when individuals encounter inconsistent or ambiguous information, they engage in compensatory cognitive processes across these dimensions to restore interpretative coherence. Successful compensation can lead to the acceptance of contradictory messages, whereas unsuccessful compensation results in disbelief or rejection. Rather than defining misinformation solely by sender intent or factual accuracy, the TRY framework can help reconceptualize misinformation as information with high potential for multiple script interpretations, emphasizing that interpretations of misinformation vary by context and reflect current socio-cognitive dynamics.

KEYWORDS
Information disorder, misinformation, incongruity theory, information processing

INTRODUCTION
Previous research on misinformation has predominantly focused on the factual accuracy of textual content or the intentions of its senders, overlooking the dynamic and complex processes through which receivers actively interpret information. However, the key to understanding misinformation's social impact lies in whether content can evoke multiple interpretations, acceptance, or rejection among receivers. This study is grounded on Hall's (1980) encoding/decoding model, which elucidates how media messages are produced (encoded) and interpreted (decoded). Producers encode messages by selecting specific codes and expressions according to their cultural background, ideological stance, and position of power. Conversely, receivers interpret these messages through their own cultural backgrounds, experiences, and social positions, often resulting in decodings that diverge from the original encoding. Building on this concept, we emphasize that receivers actively construct meanings from messages rather than passively absorbing information. This study then uses humorous texts to examine how individuals actively decode ambiguous or incongruent information, given the central role of receiver reinterpretation in humor studies. The Incongruity-Resolution (IR) theory, a dominant paradigm in humor theory suggests that humor arises when the receivers first perceives a semantic or logical incongruity (i.e., an unexpected deviation from normative expectations) and subsequently resolve this tension by reinterpreting the content in a way that restores coherence. Raskin's (1985) Semantic Script Theory of Humor (SSTH) provides a linguistic instantiation of the IR model. It builds on the cognitive concept of "scripts," mental structures that represent individuals' expectations about typical events and actions. Triggered by specific lexical cues, scripts help fill in background information that is not explicitly stated. According to Raskin (1985), humor arises when a text activates at least two overlapping scripts that are in opposition (i.e., antonymous) within the interpretive context. In 1991, Attardo and Raskin expanded SSTH into the General Theory of Verbal Humor (GTVH), introducing six types of Knowledge Resources (KRs) that shape humorous texts, thus broadening the scope of humor analysis across diverse genres. Based on SSTH and GTVH, this study proposes an extended framework, the Tri-RealitY Framework (TRY), to explain how individuals interpret and evaluate ambiguous information.

TRI-REALITY FRAMEWORK (TRY)
Building upon these models, we propose the Tri-RealitY Framework (TRY), which integrates three dimensions of reality: *General* (grounded in common knowledge), *Contextual* (guided by situational cues), and *Ideological* (shaped by personal beliefs and social identities) The TRY framework emphasizes cognitive alignment and compensatory interactions when receivers decode information. Inspired by Attardo's (1997) extension of the IR into the SIR model, we incorporate a temporal structure to emphasize the temporal structure of humor processing by adding a "setup" component that precedes the incongruity phase in humor processing.

Stage 1: Setup
When encountering new message, receivers initially interpret both the linguistic content and contextual cues (e.g., speaker intent, tone). This process triggers relevant scripts from their individual's internal KRs, helping form a coherent preliminary interpretation of the message.

Stage 2: Incongruity
Once activated, these scripts are evaluated against the individual's internal sense of reality, which operates across the following three interpretive dimensions.

General Reality. This dimension refers to general world knowledge, common sense assumptions, and logical coherence. Individuals rely on general reality to judge whether new information is plausible by mapping incoming concepts onto previously activated knowledge.

Contextual Reality. This dimension involves pragmatic cues and social signals embedded in the message context, such as tone, format, or setting. Receivers use contextual reality to infer the communicative intent of the sender and detect shifts or implicit meanings that may differ from the literal message content.

Ideological Reality. Driven by personal beliefs and social identities, individuals favor interpretations aligned with their preexisting views. When ideological alignment fails, messages conflicting with strongly held beliefs are typically rejected or resisted without thorough consideration.

These dimensions can be understood as inputs into a cognitive interpretation and evaluation process. For information to be understood and accepted, there must be alignment among General, Contextual, and Ideological Reality. When any of these reality dimensions misalign with the script-triggered interpretation, a sense of cognitive incongruity arises. This tension motivates the individual to seek resolution through compensatory reasoning.

Stage 3: Resolution
In response to this tension, receivers may shift interpretive focus toward another reality dimension. If this realignment succeeds, the message becomes acceptable. If not, they may switch the script or abandon the process. Successful resolution depends on the availability of compensatory mechanisms across these cognitive dimensions.

The TRY framework support both interpretation and evaluation. In textual analysis, Fiske (1987) and Condit (1989) highlight polysemy and polyvalence as critical concepts for understanding textual effects. Polysemy (multiple meanings) corresponds to *General* and *Contextual* Reality in TRY, while polyvalence (value variations) maps to *Ideological* Reality. Thus, under TRY, individuals may comprehend but reject a message (e.g., understanding the meaning of an offensive joke but opposing it morally) or accept without fully understanding, as in the case of conspiracy theories, where strong ideological alignment compensates for contradictions with commonsense logic, making beliefs resistant even to corrective information.

SATIRICAL CONTENT VIA TRY
To demonstrate the analytic utility of the TRY framework, we refer to Johnson et al.'s (2010) empirical study on receivers interpretations of satirical texts. Their findings revealed that receivers often "miss the joke" but still "get the message"—that is, even without recognizing the satirical intent, readers were able to interpret and evaluate the text's ideological content. This phenomenon can be effectively explained through TRY: when receivers detect exaggeration or implausibility at the level of General Reality, they may compensate by activating Contextual Reality—identifying absurd or parodic cues—and thereby adjust their expectations for logical coherence. Conversely, readers who fail to detect satire default to Ideological Reality, compensating for textual inconsistencies via personal value systems. Even without satire recognition, receivers engage ideologically to critique or accept messages. This case substantiates TRY's central claims about multidimensional alignment and compensatory interpretation processes: when triggered scripts fail alignment in one dimension, receivers shift to alternative realities for interpretative coherence.

CONCLUSION
The long-term goal of this study is to use humorous texts as a starting point for developing a more generalizable and explanatory framework for understanding information interpretation in the context of information disorder. From the perspective of TRY, we propose a refined definition of misinformation as content with a high potential to trigger multiple, divergent script interpretations. In this view, whether a given message is perceived as misinformation may vary depending on temporal and contextual factors, making it a useful lens for probing and dynamically reflecting a society's current cognitive landscape. This reconceptualization abandons the conventional focus on factual inaccuracy and instead defines misinformation as a form of cognitive misalignment among receivers. It highlights that the acceptance or rejection of misinformation is shaped less by the content itself than by the active interpretive processes and compensatory mechanisms employed by the receiver. As such, TRY offers new insights into combating information disorder.

GENERATIVE AI USE

We used OpenAI's ChatGPT solely for academic writing, including language refinement. The output was reviewed, revised and integrated by the authors to ensure fidelity to the research and academic standards. The authors assume full responsibility for the content of this submission.

AUTHOR ATTRIBUTION

Lin, Yu-Jie: conceptualization; writing – original draft; project administration; writing – review and editing. Chen, Wen-Ning: conceptualization; writing – review and editing. Jeng, Wei: conceptualization; funding acquisition; supervision; writing – review and editing.

ACKNOWLEDGMENTS

This work was financially supported by the National Science and Technology Council (NSTC) in Taiwan, under NSTC 113-2627-M-002-021-, and the Center for Research in Econometric Theory and Applications (Grant no. 114L900202＆114L910509) which is under the Featured Areas Research Center Program by Higher Education Sprout Project of Ministry of Education (MOE) in Taiwan.

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Understanding Teenagers' Mental Models of Generative AI: Insights from Drawings and Interviews

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ABSTRACT
While Gen AI tools are rapidly reshaping how we learn, work, and create, little is known about how teenagers—digital natives yet non-professional users—perceive this emerging technology. To address this gap, this study conducted semi-structured interviews with 20 teenagers in China to investigate their understanding of Gen AI and used thematic analysis to identify common themes in their drawings and responses. We found that: 1) Teenagers' mental models of Gen AI can be divided into four categories: technological, procedural, functional, and comparative; 2) Mental models' characteristics include a high degree of technical trust, and a willingness to anthropomorphize Gen AI. These findings contribute to a better understanding of teens' cognition about Gen AI, providing implications for AI literacy education of young people and the interactive design of Gen AI platforms and tools.

KEYWORDS
Generative AI; teenagers; mental model

INTRODUCTION
Gen AI has changed people's work and lives since the emergence of ChatGPT, which leverages trained models and extensive machine learning to generate various types of data such as text, images, and video (Jaboob et al., 2024). Distinct from traditional search engines, Gen AI shows anthropomorphic and autonomous characteristics (Khadpe et al., 2020), offering users an experience like communicating with real individuals (Pelau et al., 2021). Facing this new technology, people form mental models to understand it. Mental models are individuals' representations of domains or situations (Card, 2018), which highlight how individuals comprehend and engage with their surroundings (Gentner & Stevens, 2014). Existing research has analyzed the behavioral characteristics and influencing factors of users when using Gen AI tools (Faruk et al., 2023; Menon & Shipa, 2023). However, research on users' perceptions of Gen AI, particularly among teenagers, remains relatively limited. Since adults tend to have more stable and singular perspectives, teenagers, being in a developmental phase, exhibit broader and more diverse attitudes toward emerging technologies (Brizio et al., 2015). Understanding how young people engage with new technologies offers unique insights that are valuable for both technological innovation and academic research. Therefore, our study focuses on exploring teenagers' understanding of Gen AI and proposes this research question: what are teenagers' mental models towards Gen AI and what characteristics do their mental models have? Interviews including drawing tasks were conducted to explore the question.

METHODOLOGY
We adopted a semi-structured interviewing method for data collection, conducted from February 24th to March 10th, and from July 14th to August 2nd, 2024. Participants were recruited by distributing questionnaires on WeChat in China. After considering factors such as usage patterns and willingness to participate, a total of 20 respondents were recruited, forming a relatively diverse group in terms of gender, age group and education level. Given the prohibition of ChatGPT in China and the interviewees' native language, we specifically chose the ERNIE Bot in this study, which is a widely-used Chinese Gen AI developed by Baidu and has a strong ability to handle complex linguistic tasks(Ren et al., 2023).The data collection instrument comprised four steps (see Figure 1). After obtaining informed consent from teenagers and their parents, we conducted interviews either face-to-face or via telephone and employed Nvivo14 to analyze the data through qualitative thematic coding, focusing on teenagers' understanding of Gen AI and identifying their mental models regarding Gen AI.

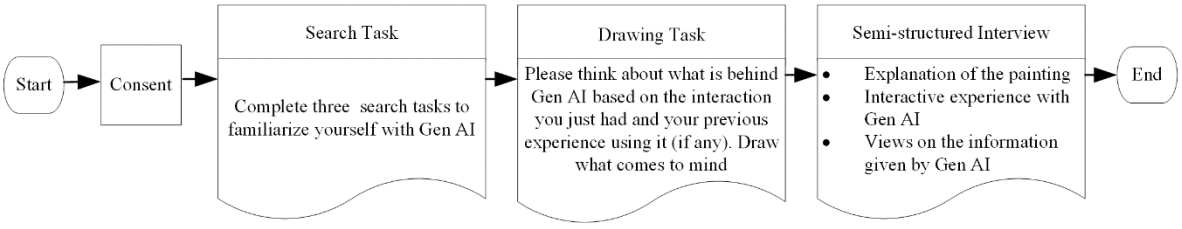
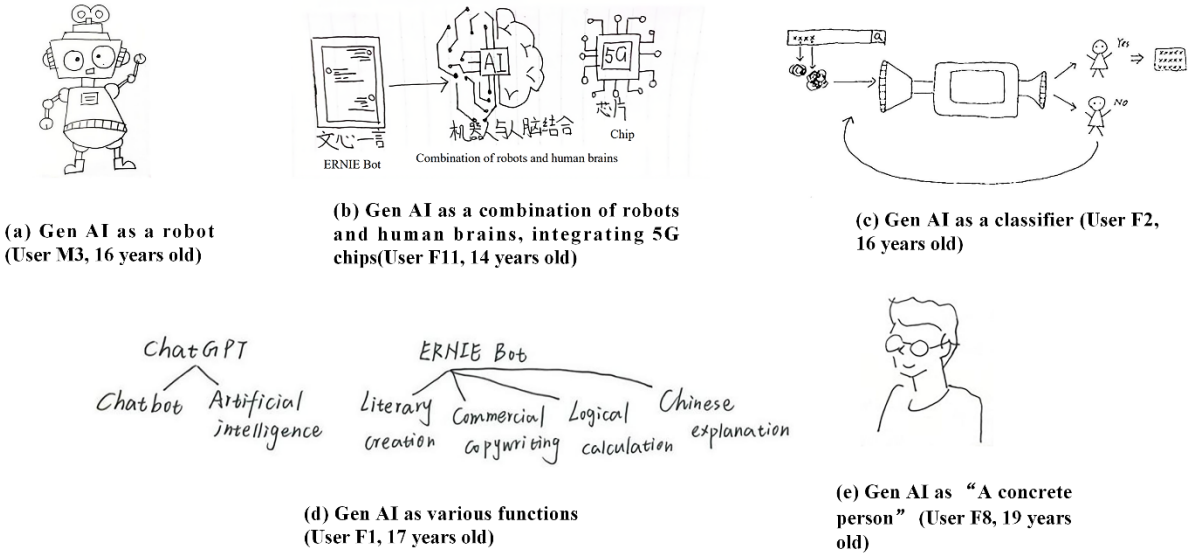


Figure 1. Summary of the study procedure

FINDINGS

We identified four distinct types of mental models that teenagers have regarding Gen AI: (1) **Technological perspective: AI technologies it represents**. Teenagers with this type of mental model perceive Gen AI as the technologies it represents, arguing that Gen AI is a highly intelligent product. For example, User M3 viewed Gen AI as robots (see Figure 2a). Others highlighted the subject that implements or utilizes this technology, considering it a product realized by human-coded programs, and the combination of both human and artificial intelligence, asserting that Gen AI is the result of the synergistic effect of both technology and people (see Figure 2b). (2) **Procedural perspective: how it works**. Teenagers who hold this type of mental model tend to comprehend Gen AI from the perspective of how it operates, contemplating the underlying work mechanisms during Gen AI's interactions with them. For instance, User F2 explained: "ChatGPT analyses the text you input, and then processes and integrates information to form a response…… if it doesn't fully meet your expectations, you rephrase your question and subsequently, it provides insights into unmentioned points or more detailed explanations, tailoring its responses to your needs.". The key elements within this category of mental models typically involve arrow symbols depicting the mechanisms at play (see Figure 2c). (3) **Functional perspective: what it can do**. Teenagers possessing this type of mental model focus on what Gen AI can do, understanding this technological system from a utilitarian perspective. For instance, User F15 believes, "I think it is actually robots writing and painting behind the scenes". The elements of their mental model primarily consist of the functions possessed by Gen AI (see Figure 2d). (4) **Comparative perspective: an upgraded version of prior tools**. Teenagers with this type of mental model pay attention to the differences between Gen AI and other tools such as search engines and smart assistants, emphasizing its advantages over prior tools. For example, User F7 compared Gen AI to "a smart assistant on a telephone, but much better, with more comprehensive information". Despite this, we also found two characteristics that emerged across teens' mental models: (1) **A high degree of technical trust**. Eleven of the interviewees believed that most of the information provided by Gen AI was correct. Their basis for this belief mainly stems from three aspects: information source, information content, and information structure. Some argue it's generally accurate since the information primarily originates from the internet and other literature resources. Others judge based on its comprehensive answer and structured presentation. (2) **Willingness to anthropomorphize Gen AI**. Users tend to anthropomorphize Gen AI during interactions and project human-like qualities onto it. For example, one interviewee described Gen AI as "knowledgeable yet light-hearted and lively". Furthermore, they form emotional associations with it. User F8 shared her experience of seeking solace from it during a period of low mood, saying she was comforted by the gentle and optimistic Gen AI (see Figure 2e).



(a) Gen AI as a robot (User M3, 16 years old)

(b) Gen AI as a combination of robots and human brains, integrating 5G chips(User F11, 14 years old)

(c) Gen AI as a classifier (User F2, 16 years old)

(d) Gen AI as various functions (User F1, 17 years old)

(e) Gen AI as "A concrete person" (User F8, 19 years old)

Figure 2. Drawings of interviewees invited to illustrate their understanding of Gen AI

CONCLUSION AND DISCUSSION

This study explores teenagers' mental models of Gen AI and their characteristics, expanding upon existing frameworks of mental models (Kodama et al., 2017; Slone, 2002; Zhang, 2008) and offering a novel lens on how young people conceptualize this emerging technology. Taking this study as the first step, future studies could expand the sample size, observe teenagers' actual usage behavior, and explore the behavioral characteristics under different mental models.

GENERATIVE AI USE

We employed the ERNIE Bot for the following purpose: Preliminary translation. We mainly used generative AI to translate the content of the interview text. We evaluated the output by manual adjustment and modification to make the conveyed meaning conform to the original text. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

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Generative AI for Art Therapy Informed Visual Emotional Expression

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ABSTRACT
Technology-supported emotional wellness interventions have gained significant traction in recent years, yet many fail to address the unique needs of marginalized populations whose identities and experiences often go unrecognized in standardized approaches. Drawing inspiration from art therapy's established success in utilizing creative expression for emotional processing, this research investigates how AI-generated content can serve as a bridge between traditional therapeutic approaches and culturally responsive care. Through a pilot study involving three participants, we identified key challenges and opportunities in leveraging AI-assisted creative tools for therapeutic and expressive purposes. Our findings reveal both technical limitations and promising pathways for developing more inclusive and culturally sensitive AI-powered visual expression platforms.

KEYWORDS
Mental Health, Technology-Mediated Emotion Support, Multimodal Large Language Model, Marginalized Communities

INTRODUCTION
Health resource disparity remains a pressing issue in our society, particularly affecting marginalized communities. Individuals from low-resource backgrounds are 2.5 times more likely to experience mental health issues but are less likely to receive adequate care (National Institute of Mental Health, 2023). In response to this challenge, technology has emerged as a promising avenue for improving mental health accessibility and outcomes. One notable development in this field is the application of chatbots in guided cognitive therapy. For instance, AI-driven chatbots have shown promising results in reducing symptoms of depression and anxiety in young adults (Kitson et al., 2024; Nakao et al., 2021).

Art therapy has long been recognized as an effective and low-risk approach for emotional expression and coping. A recent meta-analysis found that it significantly alleviates depressive symptoms in adults (Han et al., 2024). However, access to traditional art therapy remains inequitable, often requiring specialized therapists and materials that may be unavailable or unaffordable for low-resource communities (Du et al., 2024). Additionally, many individuals may feel intimidated by the perceived high bar of artistic skill required for participation (Kaimal & Ray, 2016). Previous studies have explored the use of virtual reality (VR) in art therapy, demonstrating its potential to create immersive and therapeutic experiences (Hacmun et al., 2018; Kaimal et al., 2020). However, VR technology often comes with its own set of barriers, including high costs, complex setup procedures, and potential physical discomfort (Kaimal et al., 2020). **This study seeks to explore how generative AI can be customized to support visual emotional expression and empower marginalized young adults.**

METHODOLOGY
Recruitment and Procedure
The study targets young adults (18+) with self-identified marginalized identities such as LGPTQ+, low-income. We conceptualize marginalization as subjective rather than objective, including anyone who perceives themselves as marginalized. Recruitment used purposive and snowball sampling, with clear informed consent procedures emphasizing voluntary participation and withdrawal rights to mitigate coercion concerns. Participants completed a screening survey assessing self-evaluated writing abilities, drawing/sketching skills, technology experience (including generative AI familiarity), demographics (gender, age, income, education), and mental health indicators using the PHQ-9. Initial questions explored participants' emotional states during the recent election period.

Data Collection and Study Protocol
This study investigates how AI image generation tools facilitate emotional expression among marginalized young adults through a three-phase protocol. This tool (Skybox AI) creates 360-degree images from text prompts. It produces high-resolution spherical images in various artistic styles, offers AI-assisted prompt enhancement, and allows unlimited generation attempts for iterative refinement (see Figure 1). The study procedure is shown in Figure 2, including (1) a one-minute pre-activity emotional assessment, (2) a 20-minute image generation activity where participants first familiarize themselves with the tool (5 minutes), then create images depicting "the environment where you had the happiest time with friends" while researchers track prompt iterations (15 minutes), and (3) a 30-

minute reflection period comprising a questionnaire measuring perceived agency, expressiveness, resonance, and satisfaction (10 minutes), followed by semi-structured interviews exploring emotional connectedness, previous art experience, and self-discovery (20 minutes). Throughout the protocol, researchers provide scaffolding to help participants articulate abstract emotional experiences while examining how identity-affirming AI tools might serve therapeutic and expressive functions.

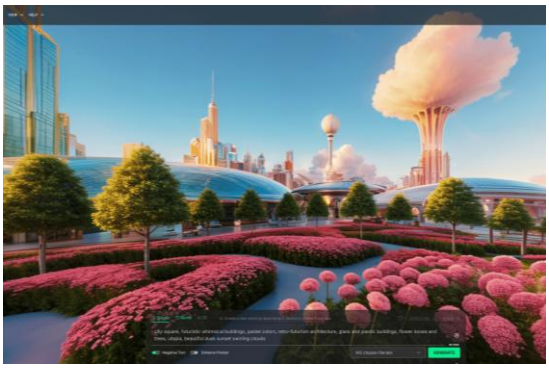

Figure 1. Skybox AI Interface

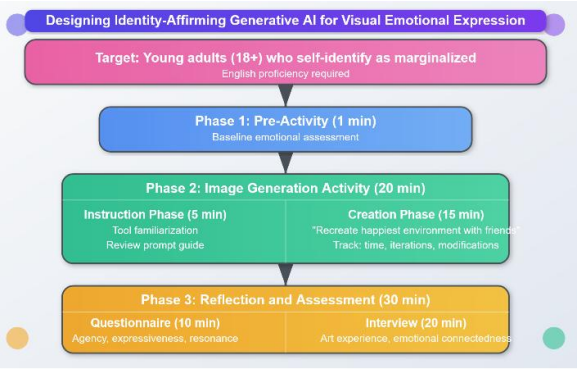

Figure 2. Study Procedure

PRELIMINARY FINDINGS

The preliminary findings from the first three sessions highlight both the opportunities and challenges participants experienced when interacting with generative AI tools. Participants appreciated the ease and enjoyment of image generation, with one noting that it was "easier and more satisfying than drawing with some crayons" (P02) and that enhanced prompts helped "refine and expand the original idea" (P02). However, several challenges also emerged during the interviews, as summarized in Table 1.

DISCUSSION AND CONCLUSION

This study explores how generative AI can be leveraged to support marginalized young adults who have historically faced barriers to creative expression and therapeutic resources. The challenges identified point to fundamental limitations in current AI systems' ability to understand and represent diverse cultural perspectives and personal experiences. The difficulty in translating mental images to AI prompts suggests a need for more intuitive interfaces that bridge the gap between human emotional expression and machine interpretation. The static nature of current outputs also highlights opportunities for developing more dynamic, multi-sensory AI-generated content.

Future research should consider developing visual interfaces that allow users to better illustrate their emotions through direct manipulation rather than purely text-based prompts. There is also substantial potential in exploring embodied artistic experiences that incorporate physical interaction and movement. Key questions for future investigation include: How can we design AI systems that are more culturally responsive and inclusive? What role can embodied drawing and physical interaction play in enhancing AI-assisted emotional expression? How might we leverage the intelligence of embodied creative processes to create more intuitive human-AI collaborative tools?

Challenge	Description	Quote
Achieving precision in creating details	AI-generated images failed to capture the emotional and cultural depth of personally significant locations.	*"The inaccuracy in catching the specifics you want—like the size of the lake—can be frustrating. Sometimes I feel like ChatGPT is so stupid, I'd rather just do it myself."* (P01)
Describing visual scenes	Participants struggled to translate mental images into effective prompts, especially for abstract or cultural elements.	*"If I had to choose between my mind's eye, reading the description, or seeing this AI-generated image… I'd probably go for my imagination."* (P01)
Static representation	Images lacked motion and sensory depth, limiting the expression of dynamic or multisensory emotions.	*"Mostly it's static. I don't think the elements can move, like in nature."* (P03)
Cultural barriers	AI often misrepresented or overlooked culturally specific details, reducing the authenticity of generated visuals.	*"I tried to create my hometown in China, and the images were so Western—maybe Hong Kong, but not my hometown."* (P02)

Table 1. Challenges faced by participants

ACKNOWLEDGMENTS

We want to acknowledge the participants who volunteered their time and engagement.

AUTHOR ATTRIBUTION

Jiaying “Lizzy” Liu: conceptualization, data curation, formal analysis, investigation, methodology, project administration, visualization, writing – original draft, and writing – review and editing; Xinyue Sally You: conceptualization, data curation, methodology, project administration, visualization, writing – review and editing; Andrew Dillon: conceptualization, writing – review and editing; Yan Zhang: conceptualization, writing – review and editing

GENERATIVE AI USE

We employed Claude for the following purpose(s): polish sentences. We reviewed and revised the returned texts before incorporating them. The authors assume all responsibility for the content of this submission.

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Preserving the Woman's Voice on the Archival Canvas: Interactive Digital Narrative Mechanisms for Jiangyong Nüshu Driven by Generative Artificial Intelligence

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ABSTRACT

Nüshu is the world's only script created and used exclusively by women, originating in the 19th century in Jiangyong County, Hunan Province, China. In the context of China's national strategy for cultural digitalization, this study explores how the distinctive features of generative artificial intelligence—multimodal content generation, creative output, and interactive iteration—can be harnessed to address the current limitations of Nüshu narrative models. Drawing on interdisciplinary literature, this study examines the technical attributes of generative AI and its interplay with mechanisms of interactive digital storytelling. Based on the SPP (System–Process–Product) model, this study proposes a new AI-driven interactive narrative model for Jiangyong Nüshu, structured along three dimensions: narrative system, narrative process, and narrative product. Additionally, this study outlines practical development strategies across three implementation aspects: data, technology, and human resources. Leveraging the creative and interactive potential of generative AI, this model provides a more dynamic and participatory pathway for Nüshu storytelling, emphasizing personalized creation and interactive engagement. The study offers new approaches to enhance public memory and cultural identity associated with Nüshu, and serves as a reference for the revitalization and sustainable development of intangible cultural heritage in the AI era.

KEYWORDS

Jiangyong Nüshu, Generative Artificial Intelligence, Interactive Digital Narrative, Living Protection, Intangible Cultural Heritage

INTRODUCTION

Nüshu, also known as Jiangyong Nüshu, is currently preserved in just over ten administrative villages in Shangjiangwei Town (in Jiangyong County, Hunan Province) and three surrounding townships. It is the only female character symbol found in the world at present, with more than 600 characters, and used to record songs and create works on paper, cloth, handwritten books and fans, usually in the form of seven-character poetry singing. As the creators and users of Nüshu gradually passed away, the script faced the threat of extinction. In 2000, Nüshu was included in the Guinness Book of Records (Records, 2000) as "the most gender specific language". In 2006, Nüshu was included in the first batch of China's intangible cultural heritage list (Hu, 2019). Although the government has realized the important role of protecting and inheriting Nüshu, there are still too many challenges and difficulties in the practice, especially in the background of the transformation and digital cultural strategy in China. As "AI for Science" (AI4S) emerges as the fifth paradigm, artificial intelligence—with its powerful computational and generalization capabilities—is driving disruptive transformations across academic disciplines (Cornell University, 2019). This shift also brings new opportunities and challenges to cultural heritage research from the perspective of digital humanities. When addressing the vast and diverse forms of cultural heritage, generative AI demonstrates unique technical advantages over traditional tools, including large-scale data processing, creative content generation, cross-modal integration, and cognitive interaction (Li et al., 2023). As imitator, creator, and collaborator, AI is now deeply involved in the production of diverse content—such as poetry, fiction, and music—pushing human–machine interaction to a new level. It also compensates for the limitations of current narrative models, particularly in terms of user-driven creation and dynamic generation. Building on this foundation, this study explores a new interactive digital narrative framework for Jiangyong Nüshu, grounded in the technical characteristics of artificial intelligence and its integration with narrative mechanisms, for addressing current challenges in the preservation and dissemination of Nüshu, such as simplistic narrative logic and limited interactivity. This framework aims to enhance public engagement with the historical and cultural significance of Nüshu, fostering memory construction and identity formation. Furthermore, it offers innovative strategies for GLAMs in the development and utilization of cultural heritage resources, contributing to more inclusive and participatory public cultural services.

LITERATURE REVIEW

Generative artificial intelligence is increasingly seen as a tool for empowering knowledge dissemination rather than widening existing information gaps (Chai et al., 2023). It has been widely applied in various narrative studies, simplifying the creation of narrative works (Chen & Chen, 2023), enabling interactive storytelling interfaces (Zhang et al., 2022) and constructing immersive virtual environments (He & Sun, 2023). These developments align closely with the evolving trends in cultural heritage narration, where generative AI offers the potential to enhance freedom,

interactivity, and immersion within the narrative process through interactive systems. However, when integrating AIGC (AI-generated content) with interactive digital storytelling, several challenges may arise—such as redundancy in multimodal content, inherent data biases, or disruptions in narrative coherence (Nie & Fan, 2024). If applied directly to Nüshu storytelling without proper control, such issues may lead to deviations or distortions of historical facts, thereby posing risks to the authenticity and integrity of cultural transmission. Therefore, it is necessary to construct a well-defined narrative pathway to guide and constrain content generation, ensuring the quality and reliability of AI-generated stories in the context of heritage preservation.

A GENERATIVE AI-DRIVEN FRAMEWORK FOR INTERACTIVE DIGITAL NARRATIVES OF NÜSHU

The characteristics of generative artificial intelligence can be broadly categorized into three dimensions: technical principles, user experience, and generated outcomes. Based on this feature analysis, generative AI provides new solutions to key challenges in interactive digital narratives (Szilas, 2015). The SPP model, proposed by Koenitz (2023), is a foundational framework for interactive digital narrative. "System" refers to the software or hardware facilitating narrative generation; once the user engages, it activates a "Process" in which the user participates in the narrative, ultimately leading to the creation of a tangible "Product".

A Generative AI-Based System for Interactive Digital Narratives of Nüshu

"Generative AI-Based System" refers to the integration of generative artificial intelligence—represented by large-scale models. Through processes like data preparation, pretraining, fine-tuning algorithms and model implementation, content generation and evaluation, these systems can rapidly process culturally rich multimodal and thematic data related to Nüshu. This integration enables a responsive storytelling experience, where Nüshu culture is dynamically interpreted and re-presented across different modalities.

A Generative AI-Based Process for Interactive Digital Narratives of Nüshu

"Generative AI-Based Process" refers to the application of generative AI's conversational and content capabilities to constructing culturally grounded narratives about Nüshu through multi-turn human–machine interaction. Without additional input, AI-generated narratives tend to be generic and unstable. To align storytelling outputs with users' intentions, human intervention—particularly through prompt engineering—is essential. Collaboration co-creates Nüshu narrative (e. g., themes, character, plot) ensuring the process remains controlled and purposeful.

A Generative AI-Based Product for Interactive Digital Narratives of Nüshu

"Generative AI-Based Product" highlights the unique creative capabilities of generative artificial intelligence, offering Nüshu practitioners and the public greater freedom and expanded possibilities for storytelling based on cultural resources. This approach enables the use of multidimensional narrative strategies, and multimodal digital media to develop personalized narrative expressions that convey the deeper meanings embedded in Nüshu cultural stories. It also enables the creative construction of Nüshu cultural memory, thus offering new pathways for the reinterpretation and dissemination of intangible heritage.

A PRACTICAL PATHWAY TO AI-DRIVEN INTERACTIVE NARRATIVES OF NÜSHU

Based on the generative AI-driven digital narrative framework for Jiangyong Nüshu, this study proposes a set of practical development pathways from three dimensions: data, technology, and human participation. These pathways encompass: the creation of specialized Nüshu cultural datasets, which will allow for the accurate representation and preservation of Nüshu in digital formats; the development of a multimodal media matrix, combining text, audio, and visual elements to support interactive and engaging storytelling experiences; and the active involvement of diverse user groups, including cultural practitioners, historians, and the general public, to ensure the inclusive and participatory development of the digital narrative.

CONCLUSION

Women in the Nüshu community not only invented and wrote sentences using their own unique syntax and grammar—typically without punctuation—but also chanted their stories, thereby asserting their voices and reinforcing their identities. The rise of generative artificial intelligence has ushered in a new paradigm of human-AI symbiosis in interactive digital narrative models. This paradigm is characterized by multimodal content generation, creative output, and interactive iteration. This technological shift presents new opportunities for the creative transformation and innovative development of Nüshu culture. Grounded in the SPP (System–Process–Product) model, this study elucidates the narrative principles and implementation pathways of a generative AI-driven interactive storytelling framework for Nüshu. It proposes feasible strategies to promote public engagement with Nüshu history and identity, while offering insights for the dynamic revitalization of intangible cultural heritage in the era of AI. Nevertheless, generative AI still presents inherent limitations, such as algorithmic bias and data-related inaccuracies. Future research should incorporate practical evaluations using specific large-scale models and continuously refine the modes of human–AI collaboration based on user feedback from the Nüshu community. This will enhance the usability of the narrative system and the credibility of its generated content.

GENERATIVE AI USE

I confirm that I did not use generative AI tools to author this submission.

AUTHOR ATTRIBUTION

Ke Liu: Conceptualization, Methodology, Investigation, Writing - original draft, Writing - review & editing.

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Reduced Information Anxiety through Academic Library Data Literacy Education

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ABSTRACT
This study investigates data literacy and its impact on information anxiety through the mediation of cognitive overload. We surveyed students, faculty/staff, and community library users at University of Rochester (UR) Libraries during the Data Bloom 2024 and Love Data Month 2025 events. Over 100 participants self-reported their information anxiety pre- and post-training using Likert scales. Partial Least Squares Equation Modeling showed significant association between data literacy, cognitive overload, and information anxiety, with cognitive overload serving as a strong mediator. Multigroup Analysis further revealed that the effect of data literacy on post-training anxiety varied across participant roles and disciplines, with students and health/social professionals benefiting more than STEM participants and faculty/staff. The findings highlight the value of academic libraries in promoting data literacy and reducing anxiety around data use.

KEYWORDS
Data Literacy; Academic Library Pedagogy; Information Anxiety; Partial Least Squares Equation Modeling

INTRODUCTION
Data literacy (DL) is defined as the ability for individuals to access, interpret, critically assess, manage, handle and ethically use data (Calzada Prado & Marzal, 2013). It has been studied on different groups of participants, including faculty and graduate students in agricultural research teams (Bracke et al., 2015), undergraduate and graduate students in using data for scientific inquiry (Qin & D'Ignazio, 2010), professionals in Big Data industries such as IT, retail, health, and consultancy (Cezar & Maçada, 2023). Different research focuses also led to various yet related terminologies. The field of library and information science (LIS) examines digital and information literacy, particularly the ways in which emerging technologies impact library patrons and their engagement with information. In response to the changing digital landscape, digital literacy pedagogy is increasingly focused on evidence-based practices, where librarians and educators use data to guide their instructional strategies. Education researchers are more concerned with the pedagogical approaches to deliver data literacy knowledge and skills. For instance, Gummer & Mandinach (2015) proposed a framework for teaching data literacy by conceptualizing it as a complex construction of individual cognition, knowledge, and skills that are evoked in different circumstances and tasks. Teaching data literacy is therefore an epistemic practice that encompasses both skills' transmission and the instructor's values, identity, and epistemology orientation (Collins & and Ferguson, 1993; Gummer & Mandinach, 2015).

The interactions between a person and the data tasks are cognitive as they entail the ways people perceive, process, negotiate, and use information. When the complexity and quantity of data exceed an individual's processing capacity, it can result in cognitive overload (CO) or information overload (Ledzińska & Postek, 2017). These conditions are well-documented in literature on human memory limitations to process information (Sweller et al., 2019), information-seeking efficiency (Bawden & Robinson, 2009), informative multitasking pressure (Kirsh, 2000), and technostress in library use (West, 2007). Cognitive overload can escalate into more severe conditions such as information anxiety (IA), which refers to stress caused by the inability to access, understand, or make use of, necessary information (Bawden & Robinson, 2009). Such challenges are more visible in Higher Education, as increasingly complex and data-driven tasks demand competencies and cognitive burdens. This study is therefore guided by two research questions: **RQ1:** Can an increased level of data literacy among academic library patrons reduce information anxiety through the mediating effect of cognitive overload; and **RQ2:** To what extent does the effect of data literacy training on post-training information anxiety vary across distinct participant groups (e.g., students, faculty/staff; STEM, Arts & Humanities)?

METHODS
An optional survey created via the LibWizard software was administered to individuals who participated in events hosted by UR Libraries Data Services from September 2024 to February 2025 under authorization of the Syracuse University (SU) and UR joint IRB committee. There were 23 unique events of the Data Bloom 2024 series or the Love Data Month 2025 series. A total of 455 individuals attended the events live and more than 100 participants completing the survey. The survey consisted of 3 demographic questions (community member type, area of study/interest, and department), 3 administrative questions, 3 workshop evaluation questions, and 14 questions corresponding DL, CO, and IA utilizing the 5-point Likert-scale: 1 for Strongly Disagree and 5 for Strongly Agree.

Names of survey participants were not collected. While emails were collected for raffle purposes, participants were not required to share email addresses.

We assessed nonresponse bias on the valid survey responses by dividing the respondents into early (N = 80) and late (N = 27) groups based on the 75th percentile submission time and conducted independent-samples *t*-test to compare DL, CO, and IA scores across the groups (Groves, 2006). No statistically significant differences were observed (DL: $t(104) = .85$, $p = .398$; CO: $t(104) = 1.12$, $p = .265$; IA: $t(104) = .47$, $p = .640$). We assessed common method bias using Harman's single-factor test on all indicators. The first unrotated factor accounted for 28.5% of the variance, which is below the 50% threshold, suggesting that the likelihood of the sample being impacted by common method bias is deemed minimal (Fuller et al., 2016). We employed PLS-SEM, a multivariate causal-predictive analytical technique to estimate relationship between latent and observable variables (Hair Jr et al., 2021). An extended PLS model was employed to include the fourth construct—IA_after, to represent post-training outcomes and estimate the impact of DL training interventions. Additionally, a mediation model was tested to assess the mediation effect of CO on IA before and post-DL training. A bootstrapping procedure with 5,000 resamples was also performed to assess the stability and statistical significance of path coefficients and Heterotrait-Monotrait (HTMT) ratio (Henseler et al., 2015). Finally, we applied Multigroup Analysis (MGA) to examine the effect of DL on post-training IA across distinct participants' groups (Matthews, 2017). Based on their responses, we classified them into—Students, Faculty/Staff, and Community as identity groups; STEM, Arts/Humanities, Health/Social, and Administrative as discipline/profession groups.

RESULTS & DISCUSSION

All indicator loadings (range = [.855, .934]) exceeded the recommended threshold of 0.70, indicating strong indicator reliability. Construct reliability was confirmed with Cronbach's α (Cronbach & Meehl, 1955) and Composite Reliability (CR) (Jöreskog, 1971) above 0.80 for all constructs (DL: $\alpha = .907$, CR = .935; CO: $\alpha = .940$, CR = .957; IA: $\alpha = .860$, CR = .914). Convergent validity was established, as all Average Variance Extracted (AVE) values were above 0.50 (DL: .782; CO: .847; IA: .780) (Götz et al., 2010). Discriminant validity was also assessed and supported, with HTMT ratios below .85 for all construct pairs. The structural model explained 34.6% of the variance in CO and 69.5% in IA. The effect of DL on CO ($\beta = -.588$, $t(5000) = -6.697$, 95% CI = [–.747, –.407], $p < .001$) and the effect of CO on IA are statistically significant ($\beta = .835$, $t(5000) = 12.692$, 95% CI = [.675, .933], $p < .001$) (see Figure 1). The direct effect of DL on IA was statistically insignificant ($\beta = .003$, $t(5000) = .032$, 95% CI = [–.201, .158], $p = .975$). Bootstrapped total effects showed a significant total effect of DL on IA ($\beta = -.488$, 95% CI = [–.692, –.274]), but the direct effect was close to zero and insignificant, indicating cognitive overload mediates the association between data literacy and information anxiety. This result is consistent with previous findings in professionals in Big Data industries (Cezar & Maçada, 2023).

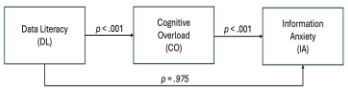

Figure 1. Structural Model

The MGA results in PLS-SEM show the effect of DL on post-training IA differs across participant groups. The standardized path coefficient from DL to post-training IA was positive and relatively strong among students ($\beta = .41$), suggesting that higher DL is associated with increased post-training confidence and reduced IA. In contrast, the effect was negative among faculty/staff ($\beta = -.18$) and community participants ($\beta = -.43$). This indicates training which improved DL also increased anxiety towards data-relevant tasks to these two groups of participants. A possible explanation is that these training are most beneficial to students while faculty/staff and community patrons may become more aware of their DL limitations and face higher expectations from training. The effect also varies between discipline/profession groups. A strong and positive standardized path coefficient was observed in Health/Social participants ($\beta = .72$), and participants conducting administrative work ($\beta = .62$). A weaker yet positive effect on Arts/Humanities participants ($\beta = .24$) and negative effect among STEM participants ($\beta = -.25$). This suggests that while DL training broadly benefits most groups, participants from STEM fields may experience increased anxiety—possibly due to higher expectations or a mismatch between the training content and task demands in STEM contexts. As evidenced among working professionals in Big Data industries (Cezar & Maçada, 2023), students and faculties in academia are also in need of DL education for reduced anxiety level towards data.

CONCLUSION

Data literacy training by academic libraries can improve the data literacy among its patrons and subsequently reduce information anxiety mediated by cognitive overload. However, the effect may vary between students and faculty, who are major groups of library users and across different disciplines/professions. Academic libraries clearly can play an important role in promoting data literacy as well as providing data services. Further research is needed to

explore how creative pedagogy may make data literacy training more effective and how academic libraries can design more effective data service to patrons on more advanced data tasks for both academia and industry.

GENERATIVE AI USE

We did not use any generative AI for this study.

ACKNOWLEDGMENTS

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Collaboration with GAI in Artistic Creation of Cultural Heritage: Approaches, Challenges and Mitigations

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ABSTRACT

While generative AI (GAI) is widely used in cultural heritage promotion, how creators engage with this technology in relevant artistic creation remains underexplored. This study conducted in-depth interviews to investigate the approaches, challenges, and mitigations of human-GAI collaboration in such contexts. We found that human-GAI collaboration processes include four stages: (1) creative context setting, (2) GAI tools evaluation, (3) creative concepts formation and (4) human-GAI collaborative production. In this process, two main challenges were identified: (1) cultural misrepresentation and (2) ambiguous intellectual property. Accordingly, corresponding mitigations were also uncovered.

KEYWORDS

Generative AI (GAI), Cultural Heritage, AI Art, Human-GAI Collaboration

INTRODUCTION

In recent years, generative AI (GAI) has been increasingly incorporated into cultural heritage promotion (Gîrbacia, 2024; Pisoni et al., 2021), where artistic creation has become a crucial way (Chen & Lin, 2024). Leveraging GAI, creators transform cultural heritage elements into various creative formats, including illustrations, short films, and animation (Spennemann, 2024). These artworks could spark audience curiosity and interests, making cultural heritage knowledge more accessible and engaging to the public (Fu et al., 2024; Liu & Qiu, 2025). Here, GAI are not merely creative execution tools, but also collaborators that promote inspiration and productivity (Anscomb, 2024), contributing to diverse expressions of cultural heritage (Cetinic & She, 2021; Chen & Lin, 2024).

Despite the increasing scholarly attention to the GAI in the art practice (e.g., Bharamnaikar et al., 2024; Veggi et al., 2025; Zhang et al., 2023), notable gaps remain in the approaches, challenges and mitigations related to human-GAI collaboration in cultural heritage artistic creation contexts. Thus, this study asks the following research questions: In the artistic creation of cultural heritage, (1) how do creators leverage GAI tools; (2) what challenges do creators encounter when collaborating with GAI, and how do creators mitigate them?

METHODOLOGY

To address these research questions, we conducted a series of in-depth interviews with experienced creators of cultural heritage. Participants were recruited using purposive sampling (Robinson, 2014) based on the following criteria: (1) at least five years of professional experience in the art, design, or media production; (2) a minimum of one year of experience with GAI tools; and (3) have experience using GAI to produce artistic content that related to cultural heritage, such as posters, short films, and animations. A total of 12 participants were recruited preliminarily, including art researchers (n=4), graphic designers (n=2), film directors (n=3), and animators (n=3).

During the interviews, participants were first asked to describe their experiences using GAI in cultural heritage projects. Next, they elaborated on the challenges they faced and how they addressed them. All interviews were recorded and subsequently transcribed. We anonymized participants' information using coded identifiers (i.e., P1, P2… P12). Clarke and Braun's (2017) thematic analysis method was adopted for data analysis.

PRELIMINARY FINDINGS

Human-GAI collaboration for artistic creation of cultural heritage

As shown in Figure 1, we found that creators' human-GAI collaboration included four stages: (1) creative context setting, (2) GAI tools evaluation, (3) creative concepts formation, and (4) human-GAI collaborative production.

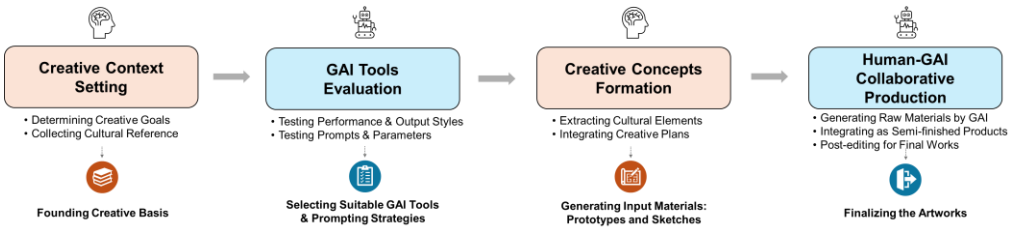

Figure 1. The human-GAI collaboration for artistic creation of cultural heritage

Stage 1. Creative Context Setting

Creators first set up their creative context by determining artistic creation goals and collecting cultural references. Participants mentioned goals such as digitally restoring heritage (P1, P5), presenting intangible cultural heritages (P2, P3, P6), and revitalizing traditional arts (P3, P8, P10, P11). Based on this, they would further acquire relevant cultural knowledge as references from search engines (P8, P10), GAI chatbot (P5, P6, P8, P12), and academic databases (P1, P2, P6). Those cultural references functioned as guidance for subsequent creation.

Stage 2. GAI Tools Evaluation

Next, specific to their creative contexts, creators normally evaluated the performance of different GAI tools through iterative testing of prompts and parameters. Specifically, this process entailed performance testing of single tools using progressive prompting (P2, P5), as well as output styles comparison across multiple tools using structured prompting (P1, P3, P8). Based on these evaluations, our participants reported selectively leveraging multiple tools within a project, aiming to enhance flexibility and efficiency in certain creation contexts.

Stage 3. Creative Concepts Formation

Drawing upon stages 1 and 2, creators further formed creative concepts. Specifically, our participants would extract specific cultural elements (e.g., *Tie-Dye* patterns, *Peking Opera* makeup) for integrating creation plans. Importantly, the cultural representativeness and feasibility of GAI creation were key considerations in extracting these elements. The extracted elements were sketched into creative planning tools, such as *mood boards* (P1, P2) and *shot lists* (P5, P7). Here, prototypes and concrete sketches would be generated, serving as input materials for final GAI production.

Stage 4. Human-GAI Collaborative Production

In the final stage, based on the curated prompts and input materials, creators first utilized GAI tools to generate substantial raw materials. Guided by the creative concepts, they reviewed, selected and integrated the most suitable ones as semi-finished products. After that, they would engage in manual editing and adjustment to finalize the artworks. The abovementioned collaboration was deemed essential. According to participants' feedback (P3, P4, P5, P8, P10, P12), it was hard to achieve detailed edits and control of visual elements by relying solely on GAI. This means the raw materials generated by GAI were sometimes unpredictable. Therefore, our participants (P6, P8) often utilized professional editing tools like *Photoshop* to optimize the outputs, including removing, compositing and/or harmonizing the elements generated by GAI.

Challenges and mitigations

We identified two main challenges in human-GAI collaboration for cultural heritage artistic creation, including (1) cultural misrepresentation and (2) ambiguous intellectual property (IP). Accordingly, corresponding mitigations were also uncovered.

Cultural Misrepresentation

Several participants (P1, P3, P8) highlighted the limitations of current GAI tools in accurately generating culturally specific motifs, symbols, or patterns. For example, P3 reported that when she prompted “Chinese patterns”, the outputs mistakenly reflected elements from the Thai culture. Such misrepresentations not only risk misleading audiences but may also perpetuate cultural stereotypes. To mitigate this challenge, participants (P4, P8, P9) suggested that creators should (1) possess sufficient cultural heritage background knowledge, (2) develop prompting skills to effectively instruct GAI, and (3) carefully review and critically select GAI outputs.

Ambiguous Intellectual Property

The ambiguity of IP was a concern in GAI artistic creation. Since GAI tools were typically trained on extensive datasets with undisclosed or uncertain sources, many participants (P4, P7, P9, P11) expressed apprehension about copyright infringement and unintentional plagiarism. As P4 noted, “The ownership of AI-generated content remains a gray area, which leaves creators vulnerable to copyright disputes and legal challenges.” In this regard, several mitigation strategies were highlighted by our participants (P4, P7, P11). One, creators were advised to obtain appropriate licenses before generating content using GAI. Two, to enhance transparency and prevent audience deception, it is essential to disclose the GAI usage during the dissemination process. Three, clearer guidelines and regulations could be established by relevant entities, aiming to define the IP boundaries of artistic creation in GAI contexts.

CONCLUSION

This study investigates the approaches of human-GAI collaboration in the artistic creation of cultural heritage. Further, it identifies challenges faced by creators and outlines corresponding mitigations. Our findings offer insights for practitioners on leveraging GAI for cultural heritage preservation and promotion. However, due to the nature of qualitative research, this study may lack generalizability. Future research can adopt quantitative or mixed-methods approaches to validate our findings. Additionally, as we merely focus on the perspectives of artistic creators, investigations into the views of other stakeholders (e.g., audiences) may broaden the scope of understanding.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author: conceptualization, investigation, data curation, formal analysis, and writing – original draft; Second Author: conceptualization, investigation, visualization, and writing –review & editing.

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Human-AI Interaction Data Governance in Personal Health Management: Literature and Cases Analysis

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ABSTRACT
This study investigates data risks in human-AI interaction within personal health management apps and systems. Drawing on literature, cases, and policies, it analyses data types, governance practices, and potential risks. Using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines and thematic analysis, 116 articles, 9 cases, and 4 key policies were examined. Identified data types include physiological indicators, lifestyle habits, personal identity, and social relations. Governance practices and risks are categorised into six dimensions: governance subjects, policies and standards, technologies and facilities, lifecycle measures, data rights protection, and risk management. The study offers governance strategies for human-centred AI and lays the groundwork for further assessment of risk types and severity.

KEYWORDS
Human-AI interaction, Personal health management, Data governance, Risk management

1 INTRODUCTION
Personal health management applications increasingly integrate a new generation of human-AI interaction tools. These technologies generate sensitive data through functions such as personalized monitoring, feedback, and decision support (Thomas et al., 2021; Ogawa et al., 2022; Hwang et al., 2024). International and national governance bodies—such as the ITU/WHO, EU, UK, and China—have introduced legal and ethical frameworks addressing digital health, privacy, and data standards. However, limited research has systematically explored how human-AI interaction is implemented in these applications or how it shapes data governance challenges in real-world contexts (Sharma et al., 2024).To address this gap, this study conducts a systematic thematic literature review to analyze the types of data generated through human-AI interaction and the associated governance risks. Thematic analysis is well-suited to this purpose as it enables the identification of recurring patterns and risk factors across a heterogeneous body of literature, facilitating the development of a conceptual governance framework. Specifically, the study addresses two questions: ***Question 1***: How is human-AI interaction integrated into personal health management apps? and ***Question 2:*** What data governance challenges and potential risks do these technologies pose for personal health management?

2 RESEARCH PROCESS
The first phase involved retrieving relevant literature following the PRISMA guidelines, while the second phase focused on identifying representative cases and policies through literature analysis. Figure 1 illustrates the literature collection process, aligned with the PRISMA 2020 flow diagram. To ensure comprehensiveness and rigour, a systematic literature review was conducted by searching major academic databases—selected for their broad interdisciplinary coverage and inclusion of peer-reviewed, high-quality sources—and by performing backward and forward citation tracking for studies published before November 7, 2024. Search terms were developed based on preliminary scoping and aligned with key concepts in digital health and human-AI interaction. Terms included “AI and health management”, “intelligent health management” or “smart health management”, and “human-AI interaction and health”. These terms captured the core focus on technology use and user interaction. Studies were included if they: involved AI technologies, were situated in non-clinical health management contexts, and featured direct or indirect human-AI interaction. Exclusion criteria included studies focused solely on clinical diagnosis or treatment, those without original data, or those lacking a clear human-AI interaction component. After a three-step screening process—title review, abstract screening, and full-text evaluation—116 articles were finalised for analysis. Based on literature, 9 illustrative cases and 4 key policy documents (see Table A) were extracted to complement the findings and support a theoretical saturation test (Ando et al., 2014).

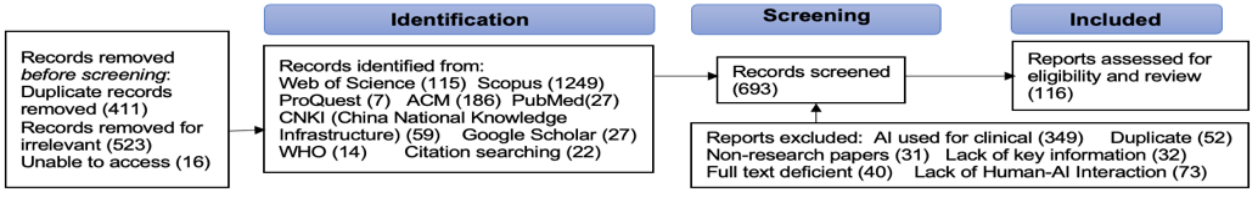

Figure 1. Literature collection process

Thematic analysis includes the selection of quotations, keywords, coding, themes, conceptualisation, and conceptual model development (Naeem et al., 2023). Core messages were extracted and coded based on the categories in Table 1, then grouped to reveal patterns and relationships relevant to the research questions (see Table B in appendix). Finally, a theoretical framework was constructed (see Fig. 3).

Categories	Explanation
Application scenarios	Which health management situation the case is applied to, e.g., weight management, chronic disease management, and such.
Service contents	What types of health management services are provided, such as health data monitoring, mental health promotion, and so on.
AI technology applied	What AI methods are used, such as machine learning, natural language processing, deep learning , and more.
Interactive data	Specific forms of user interaction with the AI in the case, talk to AI chatbot or just use digital applications embedded with AI technology.
Data governance practice	Different data models or contents involved in human-AI interactions, such as textual data, audio data, physiological metrics, personal social conditions, psychological conditions , and more.
Data governance risks	Data governance practices mentioned, such as data storage methods, data security measures, data authorisation management, etc.

Table 1. Text analysis categories

3 RESULTS

Four areas of human-AI interaction emerged from the literature: application scenarios, service contents, AI technologies applied, and data types. The application scenarios in the top box contain health monitoring, intervention and coaching, chronic disease management, mental health management and elderly care. The service contents in the central circle include health monitoring, weight management, mental health promotion, etc. The applied AI technologies consist of ML(machine learning), NLP(natural language processing), etc. The interaction data contents include health-related data and health service-related data (see Fig. 2).

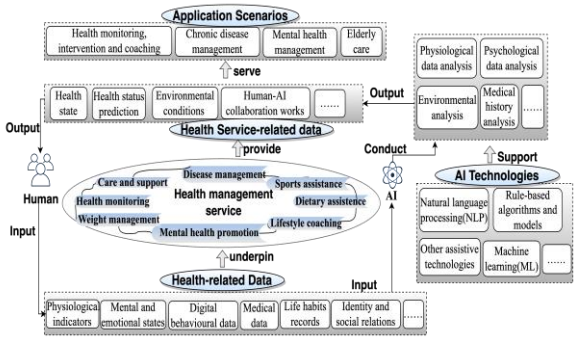

Figure 2. Overview of Human-AI Interaction

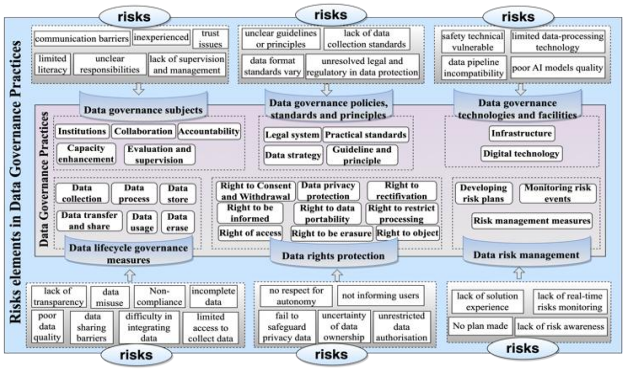

Figure 3. Data Governance Practices and Risks

Figure 3 shows risks in six categories of data governance practices based on themes and codes from the literature. The content in the middle box is data governance practices. The peripheral boxes are risks in governance practices. Specific elements under each category are shown in Table C in the Appendix. As for the governance subjects category, risks like communication barriers, lack of liability, experience, supervision and management, poor literacy, and trust issues between users and applications are mentioned. In the policies, standards, and principles category, risks like unclear data collection guidelines and ethics, lack of data protection regulations, varying data format standards, and lack of data collection standards are discussed. The main risks in the technologies and facilities category are vulnerable safety technical, limited technology to interpret complex data, data pipeline incompatibility and poor quality of AI models. In the data lifecycle categories, risks include limited access to collect data, difficulty in interpreting complex data, poor data quality, lack of transparency in data processing, etc. In the data protection category, risks including no respect for autonomy, no informing users, unrestricted data authorisation, etc., are emphasised. In the data risk management category, risks include lacking risk awareness, real-time risk monitoring, solution experience and plans.

4 DISCUSSION AND CONCLUSION

This study examines the current state of the literature on human-AI interaction in personal health management, data governance practices and risks. In personal health management (Q1), human-AI interaction includes four aspects: application scenarios, service contents, AI technologies applied, and interaction data type. As for Q2, the data governance practice and potential risks cover six categories: governance subjects, policies, standards and principles, technologies and facilities, lifecycle measures, data rights protection and risk management. Theoretically, this study explores the governance risks involved in human-AI interaction data and comprehensively constructs a data governance risk framework to improve the governance theory of human-AI interaction from the data perspective, which can guide the development and application of human-centred AI compliance. Practically, this study can provide guidance for AI technology risk regulation from the data governance dimension. This study has some limitations on only focusing the second-hand data like research literature and fluid definitions of “AI”.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Liu, Xianrui: Conceptualization, methodology, data curation, data formal analysis, visualization, writing – original draft; Shankar, Kalpana: Conceptualization, methodology, writing – review and editing, supervision.

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APPENDIX

Data tables are found here.

AI's Usefulness in Assisting with Health Insurance Literacy

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ABSTRACT
Artificial intelligence (AI) now appears with the search engine results, and this may influence how users interact with search results. This study examined how the incorporation of AI within the information seeking process affected people's health insurance literacy (HIL). Using a HIL measurement, the HIL of young adults was assessed through a simulated Google search for health insurance information. Findings revealed that only 17 of the 41 participants used AI to improve their health insurance literacy, although participants expressed a desire for a simplified explanation of health insurance.

KEYWORDS
Search, AI, health insurance literacy, health insurance literacy measure

INTRODUCTION
Despite over 86% of the U.S. having internet access, the trend of online health information search increased health literacy disparity rates (Jacobs et al., 2017). AI could be a potential solution to the complexity of health information, specifically health insurance information, providing consumers with simplified and personalized insight (Volin & Ellmore, 2024). However, the search engine results page (SERP) can evoke various biases in users, with the perception and processing of new information impacted via the layout, content, and cues. Google's AI provides summarized personalized answers, influencing information search and raising concerns about biases and misinformation (Zhou et al., 2023). This study was interested in AI adoption in the search for health insurance information and whether AI can mitigate the complexity of health insurance.

While consumers value medical coverage, many have chosen inappropriate health insurance due to information overload, information avoidance, information illiteracy, and misinformation (Kim et al., 2013). Disparities in healthcare access can be partially attributed to disparities in health insurance literacy (HIL), which has been defined as the ability to locate, navigate, evaluate, and utilize health insurance information to make financially informed healthcare decisions (Edward et al., 2019; Quincy, 2011; Upadhyay et al., 2022). For the U.S., HIL is essential for navigating a privatized marketplace and controversial health insurance landscape (Rucker et al., 2023; Paez et al., 2014). But low levels of HIL were identified among college students, who had significant gaps in understanding plan types, cost-sharing calculations, and health insurance related topics in comparison to other demographics (Adegboyega et al., 2020; Edward et al., 2019; Nobles et al., 2019). Low literacy levels have consequences such as delayed medical care, especially when young adults transition into an ever-changing economy and workforce (Nobles et al., 2019).

Now that current internet SERPs have included AI on their interface, this study was interested in its effect on HIL. This study examined college students 18-25 seeking health insurance information through an online search engine and then analyzed their HIL. Study participants were asked to use a simulated Google search engine results page (SERP), which included health insurance information sources and AI generated text. Participants were then asked to create a writing output about health insurance. The participants' search data was analyzed using a health insurance literacy measure (HILM), assessing the literacy of each participant after their search. The research aimed to answer the following question: **RQ:** Does the AI within current internet SERPs provide health insurance information that increases health insurance literacy (HIL)?

METHOD
A mixed methods approach was used to assess the HIL of 41 university students drawn from convenience sampling and live recruitment at the host institution. Participants were brought into a lab, and after providing consent, they were asked to use a controlled Google SERP simulation. The simulation included 10 pre-selected health insurance information websites and AI text. The AI text was generated by Google. Insurance information websites included a combination of government and corporate websites (see Figure 1). Participants were provided with a **task**: *Imagine you have a family member who cannot conduct a Google search, conduct a search for the family member to help them understand health insurance. Write them a message in the final answer box.* The main variable of interest was the frequency with which participants read/copied the SERP's AI text to assist with their literacy of health insurance versus using the health insurance information sites. Data was collected through participants' user interface metrics, including queries, clicks, copies, time spent on sites, video recordings, screen recordings, their final answers and their cognitive walk throughs. Each participant was asked to "think aloud" as they searched.

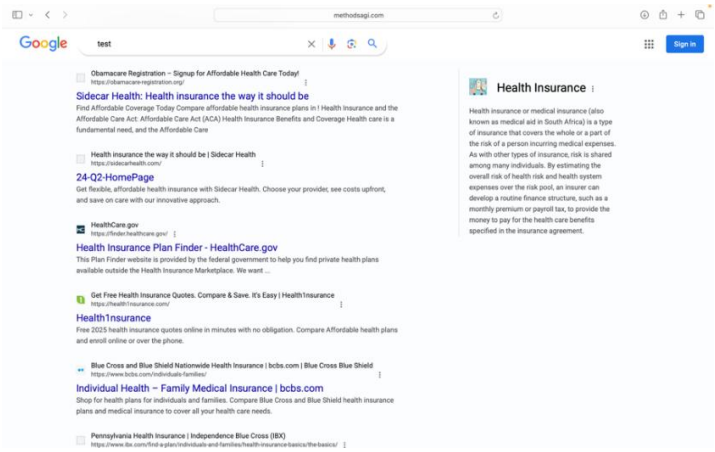

Figure 1. Google SERP Simulation

This study specifically used the health insurance literacy measure (HILM) to assess participants' understanding of health insurance information (Paez et al., 2014). The measure used a conceptual model divided into 4 categories: knowledge, information seeking, document literacy, and cognitive skills. Each category contains 4-5 sub-sections that a participant could complete to achieve *self-efficacy*, or the confidence and literacy to engage with the health insurance system. The HILM includes**: 1. Knowledge**: insurance terms, types of healthcare services, insurance concepts, beneficiary rights; **2. Information seeking:** formulate and articulate questions, locate healthcare plans, evaluate credibility of information sources, navigate information sources; **3. Document literacy**: read and follow instructions, interpret summary of benefits and documents, use schedules, complete health insurance forms; **4. Cognitive skills:** assess preventative care needs and personal risk, project healthcare utilization, apply health plan benefits to personal situation, calculate cost sharing, assess value, weigh cost vs benefits relative to health service needs.

DATA ANALYSIS & FINDINGS

For this data analysis, screen recordings and video recordings of cognitive walk throughs were analyzed. Coders monitored the frequency that participants search for, engaged with or verbally requested health insurance information. The coders denoted which HILM category and sub-category best represented the participant's information seeking behavior. Coders also denoted if and how participants utilized AI during their information search. AI utilization included reading, referencing or copying the AI-generated text. Due to the lab format, videos averaged around 10 minutes. A total of 3 coders were used for inter-coder reliability.

Out of 41 participants, 17 used AI explicitly for one category of the HILM-knowledge**.** Within the *knowledge* category of the HILM, participants only utilized AI for two sub-categories: understanding *the definition of health insurance* or understanding *the concept of how health insurance works.* During the cognitive walkthrough, participants verbally requested a simple definition for health insurance and a breakdown of how the process works. Due to the limitations of Google's AI (at the time of the study), the simulation's AI generated text was not useful to some participants. Several participants re-queried before gathering definitions and basic concepts from corporate insurance companies (Blue Cross Blue Shield) websites and government (.gov) backed websites, which were the information sources most frequently used among all participants.

DISCUSSION & CONCLUSION

Participants used AI for the one category of HILM, which was knowledge-based definitions and concepts. This suggests that students sought simplification but may have lacked strategies to go beyond surface-level understanding. The cognitive walkthrough revealed that even when participants were presented with an AI shortcut, most participants relied on more expansive government and corporate websites, especially when exploring other aspects of health insurance literacy. AI was unable to assist in the development of HIL through cognitive skills, information seeking, or document literacy, which equated to a lack of self-efficacy for participants when navigating the health insurance system (Paez et al., 2014). While the simulated AI text box may have enhanced access to simplified definitions, it did not fully support broader skills, tasks, or development required for navigating health insurance or forming HIL.

This study found that AI-integrated search tools still have limited potential in improving health insurance literacy for young adults. While some students used AI to clarify basic insurance concepts, most did not meaningfully engage with it. This infers that AI's interface design, relevance, and usefulness require further development. Future research has been planned to test the impact of AI on SERPS and information literacy with changes to both placement and the usefulness of the content.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Amanda A Lockett: conceptualization, methodology, data curation, formal analysis, writing – original draft, reviewing and editing, project administration; Alamir Novin: conceptualization, data curation, formal analysis, methodology, project administration, resources, software, supervision, writing – reviewing and editing; Laila Conway: conceptualization, data curation, validation, writing – reviewing and editing.

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Disclosing Generative AI Use in Digital Humanities Research

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ABSTRACT
This survey study investigates how digital humanists perceive and approach generative AI (GenAI) disclosure in research. The results indicate that while digital humanities scholars acknowledge the importance of disclosing GenAI use, the actual rate of disclosure in research practice remains low. Respondents differ in their views on which activities most require disclosure and on the most appropriate methods for doing so. Most also believe that safeguards for AI disclosure should be established through institutional policies rather than left to individual decisions. The study's findings will offer empirical guidance to scholars, institutional leaders, funders, and other stakeholders responsible for shaping effective disclosure policies.

KEYWORDS
Digital humanities, Generative AI use disclosure

INTRODUCTION
Generative AI (GenAI) now permeates almost every aspect of daily life and has become integral to academic work. Although its use offers clear benefits to researchers, it also raises challenging questions about academic integrity and research ethics (Van Noorden et al., 2023; Hosseini et al., 2023; Abdelhafiz et al., 2024; Dedema & Ma, 2024; Ng et al., 2025). As a result, scholars continue to debate how best to acknowledge AI involvement in both professional and broader contexts. Disclosure has therefore emerged as a potential policy solution. For example, Resnik et al. (2025) proposed a three-tier framework distinguishing mandatory, optional, and unnecessary disclosure, demonstrating the increasingly nuanced guidance now issued by publishers. Publishers agree that GenAI tools cannot be listed as authors, yet their disclosure policies vary. Most now distinguish between routine language polishing (e.g., grammar, spelling) and substantive content generation: the former typically escapes disclosure, whereas the latter demands it. For example, the STM (2023) association advised that authors do not need to declare AI-assisted copy-editing but must disclose any use that goes beyond those tasks. Implementation of AI disclosure principles at the journal level also varies. At the strict end, journals such as Wiley (2023) titles and *Science* (2023) require detailed statements describing the software, its provider, and even the prompts used, with authors affirming full responsibility for AI-generated text. *Springer Nature* (2023) adopts a moderate stance, insisting that generative use be "properly documented" while exempting minor editing. IOP Publishing (n.d.), acknowledging the ubiquity of these tools, merely encourages transparency and reminds authors they remain accountable for all content.

However, policies that mandate AI disclosure can produce unintended consequences. Empirical research has identified an "AI disclosure penalty" that surfaces in both professional spheres and personal or creative domains. The magnitude of the penalty varies by context: In professional settings, studies report moderate penalties (e.g., Reis et al., 2024; Proksch et al., 2024); while in creative contexts, penalties are generally smaller but still statistically significant (Horton Jr. et al., 2023). Studies have also consistently suggested the AI disclosure reduces perceived credibility across news, health, and business contexts, to name a few (Longoni et al., 2021; Henestrosa and Kimmerle, 2024; Reis et al., 2024).

Given these context-dependent penalties, understanding how different audiences interpret AI disclosure approach is important. Against this backdrop, some researchers adopt a community-centered perspective, examining stakeholders' needs and expectations around AI disclosure. A recent *Nature* survey, for example, reveals deep divisions among scholars over whether GenAI use should be declared at all and, if so, how much detail such declarations should include (Kwon, 2025). We content that a community-centered lens is essential for navigating the complex terrain of AI disclosure, where formal policies intersect with the professional cultures that ultimately determine their uptake. Therefore, we adopt a community-based approach in this study, exploring how researchers view GenAI disclosure and how their views might shape future disclosure policies. We focus on the digital humanities community as a case study, an inherently interdisciplinary field that brings together scholars with diverse expertise (Luhmann & Burghardt, 2022), to gauge attitudes toward declaring GenAI use in research. Specifically, we examine: 1) To what extent do digital humanists regard disclosure of GenAI use as necessary? And in what forms? 2) In which research contexts and for which research activities should GenAI involvement be disclosed? 3) Who should be responsible for developing and enforcing GenAI disclosure policies and practices? By addressing

these questions, we aim to capture the digital humanities community's collective views on GenAI disclosure and to advance discussions about field-specific effective strategies for incorporating AI responsively into research.

METHODS

We developed a Qualtrics survey (available here) to investigate these questions which contains 30 questions organized into 3 sections: (1) demographic background, (2) attitudes and preferred practices for GenAI disclosure, and (3) self-reported AI literacy. Due to the lack of a clear definition for "digital humanist" (Ma, 2022; Ramsay, 2011), we employed a self-identification approach: everyone who consider themselves as a digital humanities scholar was eligible to participate in the survey. The survey was distributed from 20 February to 6 May 2025 via social-media platforms (X, Bluesky, Slack, LinkedIn) and leading digital humanities mailing lists. We received 152 responses; after data cleaning, 99 fully completed surveys remained for analysis. Respondents span a wide range of DH subfields such as literary and cultural studies, history, information science, and represent a geographically diverse community across the United States, United Kingdom, European Union, China, and beyond. An exploratory data analysis revealed the following initial insights.

PRELIMINARY FINDINGS

The findings show that 63% of the digital humanists (n=63) think it is necessary to disclose GenAI use. Among these respondents, the majority (54%, n=53) vote for "brief disclosure (model/version, parts generated by AI, etc.)" followed by "detailed disclosure (full description of process, example prompts, etc.)" (36%, n=36), "minimal disclosure (Yes/No)" (7%, n=7), and "prefer not to answer" (3%, n=3). Despite broad agreement on the value of transparency, practice of GenAI disclosure remains limited. Only 28% of the participants (n=28) who acknowledge the necessity of GenAI disclosure have actually disclosed in their research before. Among those who have disclosed, 20 report they have done so only 1-2 times, and they disclosed voluntarily (n=20). This gap suggests that while researchers recognize the importance of disclosing AI use, concerns about potential negative consequences, and the associated social stigma, may not be fully resolved through policy alone.

The survey also indicates that digital humanists' disclosure priorities differ by activity and research context. Across the sample, the three activities most frequently prioritized for disclosure are (1) writing and rewriting, (2) data collection, transcription, translation, and analysis, and (3) peer review. Cross-tabulating this question (Q15) with respondents' primary research fields (Q5) reveals a largely consistent pattern: every discipline except computer science ranks "writing and rewriting" as the foremost activity that requires disclosure. Computer scientists instead place "brainstorming" at the top. Specifically, among respondents who rank "writing and rewriting" as the top activity requiring disclosure, 31 identify themselves as "Literary and Cultural Studies" scholars, highlighting the essential role of writing in their scholarship and the perceived obligation to disclose any GenAI contribution to that process. Finally, we also find that most digital humanists think AI disclosure is an institutional, rather than individual, responsibility. Among the 99 surveyed participants, most distribute responsibility across the scholarly ecosystem, but with a clear hierarchy. Journal publishers and editorial boards are viewed as the primary gatekeepers (87%, n=86). Academic institutions follow closely (86 %, n=85), reflecting expectations that universities set and police their own standards. A second tier—professional societies (n=69), funding bodies (n=68), and ethical-review boards (n=61)—also commands majority support, signaling a preference for multilayered oversight within the research community itself. Government agencies receive moderate support (n=52), but confidence declines for actors more distant from day-to-day scholarship: industry organizations and independent oversight bodies (each n=37) and international entities such as UNESCO (n=36).

CONCLUSION

The survey study reveals a shared recognition of the importance of disclosing GenAI use, but divergent views on how such disclosure should be integrated into research practices. Next, we will examine whether factors such as scholars' AI literacy, personal AI experience, disciplinary affiliation, career stage, and seniority shape these views. The goal is to produce a comprehensive account of digital humanists' disclosure practices and attitudes. Over the longer term, we will administer a follow-up survey to track how digital humanists' collective sentiment evolves as AI technologies continue to advance.

GENERATIVE AI USE

We employed ChatGPT for grammar check and stylistic editing. The authors assume all responsibility for the content of this submission.

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Toward Agency-Centered AI Literacy: A Scoping Review

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ABSTRACT
Digital literacy is well-studied across disciplines, with established attention to core competencies and social inequalities. However, artificial intelligence (AI) literacy remains underexplored. To address this gap, we conducted a scoping review on AI literacy to: (1) consolidate current definitions and pinpoint conceptual gaps, (2) evaluate methodological approaches and their relevance in practice, and (3) examine how social inequalities are considered in AI literacy studies. Definitions of AI literacy are inconsistent across and within disciplines, and most studies do not consider social factors. Most definitions focus on knowledge and skill acquisition, framing AI literacy as a suite of acquired competencies. We argue that current understandings of AI literacy need to expand to include informed decision-making, critical engagement, and resistance to technological coercion by taking an agency-driven approach. These insights can guide researchers, educators, and policymakers in fostering an agency-centered AI literacy that empowers individuals in an increasingly AI-mediated world.

KEYWORDS
AI literacy, digital literacy, social inequality, digital inclusion, scoping review, user agency, policy making.

INTRODUCTION
As AI tools increasingly permeate everyday life, conceptual frameworks are being developed to study the public's understanding of and engagement with them (Long & Magerko, 2020; Ng, Leung, Chu, & Qiao, 2021; Carolus et al., 2023; Ng et al., 2024). Previous insights from algorithmic literacy have proven to be instructive, demonstrating that the lack of public awareness of algorithms makes it difficult to develop meaningful AI literacy (Gran et al. 2021). Moreover, algorithms tend to be highly opaque and black-box in nature, creating obstacles to grasping what they are doing and how they function (Burrell, 2016; Petrovčič, et al. 2024). Van Deursen and Mossberger (2018) highlight how this has potentially far-reaching implications for people with differing skill levels. However, the accelerated pace of AI proliferation has made it necessary to develop broader understandings of AI literacy (Long & Magerko, 2020; Ng, Leung, Chu, & Qiao, 2021), understood as a distinct form of algorithmic literacy. This area of research is still largely unstandardized and lacks comprehensive scope. Existing studies tend to focus on measuring AI literacy through the construction of assessment scales (Lintner, 2024). The risk of focusing too soon on measurement is that these assessment scales do not capture the nuance of lived experience, including how people use, understand, and integrate such tools into their everyday contexts. Indeed, scholars and practitioners are calling for the development of AI literacy as an integral part of digital equity, given a society that is increasingly reliant on AI integration (Cotter & Reisdorf, 2020). Therefore, this scoping review explores research on AI literacy to: (1) consolidate current definitions and pinpoint conceptual gaps, (2) evaluate methodological approaches and their relevance in practice, and (3) examine how social inequalities are considered in AI literacy studies. Based on the scoping review findings, we suggest an agency-based framework that incorporates critical engagement, informed decision-making, and resistance to technological coercion as necessary responses to AI systems.

METHODS
We conducted a scoping review to identify gaps in existing AI literacy studies. While systematic reviews address narrowly-defined research questions, scoping reviews allow for nimble exploration of emerging fields where theories and methods are still developing and not well understood or formulated (Arksey & O'Malley, 2005; Levac et al., 2010). Using the search query "(``algorithm* literacy" OR ``algorithm* awareness" OR ``artificial intelligence literacy" OR ``artificial intelligence awareness") AND (study OR test OR interview* OR questionnaire OR experiment* OR qualitative OR quantitative)", we searched 11 databases from June 12 to June 30, 2024 - including *ERIC*, *Science Direct*, *Scopus*, *Google Scholar*, and *Web of Science*. We extensively tested various combinations of search terms for efficacy before arriving at the final search string. Given the recency of the topic, we extracted relevant sources published between 2015 and 2024. Three researchers independently checked each source to verify that it met the inclusion criteria, such as peer-reviewed journal or conference article. The exclusion criteria were: short/excessive length (e.g., extended abstracts and theses), non-academic writing (e.g., policy reports), irrelevant topics, and duplicates. We focused on papers written in English due to our language limitations. Using the above criteria, we removed 157 entries from 273 initial papers. This resulted in 129 studies which examined AI or

algorithmic literacy for non-specialist user groups. We then performed a thematic analysis (Braun & Clarke, 2007) and developed a coding framework with six primary themes to classify the definitions of AI, algorithms, and literacy; methods; purposes and goals of the given studies; social contexts; the theoretical foundations; and findings/recommendations. The researchers established intercoder reliability by independently coding 15 papers, achieving more than 90% agreement after two rounds.

FINDINGS

The scoping review indicates that terminology describing AI literacy is inconsistent. We found that 47% of studies (*n*=61) use AI literacy as their primary definition, 24% (*n*=31) focus on algorithmic awareness, and 13% (*n*=17) use other terms. Most studies (*n*=100) discuss AI or algorithms as generic umbrella terms, and only a few (n=17) explore specific applications of AI technology. This demonstrates that most current studies fail to capture the nuance of different AI tools, which can range from applications like customer service chatbots to technical processes such as machine learning and neural networks embedded within infrastructural systems. Results show that current AI literacy frameworks focus on knowledge and skill acquisition, framing AI literacy as a suite of acquired competencies. Of 129 papers, 68% (*n*=87) discuss AI literacy as a type of competence, encompassing knowledge, skills, attitudes, and ethical considerations. Other papers construct literacy as either knowledge/awareness or an individual's capability to identify or effectively utilize AI systems. Even when literacy frameworks claim to include an individual's ability to critically evaluate AI tools, they do not examine whether users question power structures or implications/interventions. Most of the studies measure their constructs via interviews or questionnaires that solicit self-reports, rather than through in-context demonstrations. Around half (48%) of the studies use quantitative methods (n=62), with 39% of these examining knowledge and misconceptions of AI systems. Of the total 129 papers, 33% (*n*=43) aim to cultivate an awareness and understanding of AI or algorithmic systems without addressing users' holistic decision-making concerning AI (what we regard as "agency"). Of the papers that *do* address agency, they equate it with the maximization of one's ability to wield the tools, rather than with the capacity to resist or refuse them—treating non-participation as illiteracy, rather than informed choice. Furthermore, we found that most studies overlook the critical impact of social factors during the acquisition of AI literacy. Almost half (46%) of the studies (*n*=59) do not meaningfully examine factors of social inequality, and an additional 28% of studies (*n*=36) collected information about the socio-economic status of their participants only for demographic statistics of their sample. A minority of studies examine how aspects of socio-economic status (16%, n=21) or digital inequality (10%, n=13) impacts participants' AI literacy. This suggests that studies are capturing an incomplete picture of what shapes AI literacy in the public by overlooking social and other structural factors.

DISCUSSION AND CONCLUSION

This study suggests that AI literacy is often conceptualized and measured in narrow ways, while studies on user understanding of algorithmic systems tend to take an overly broad approach. Our concern that studies are too superficial to fully understand the AI literacy of the general public is justified by current research, which warns that AI systems could create new forms of harm and inequality (Petrovčič et al., 2024; Wang et al., 2024). Foundational literature should aim to understand AI literacy in terms of the implications for new digital divides and critical engagement, promoting an agency-centred approach. Agency in this context refers to the capacity for informed personal action that requires the convergence of knowledge, power, and appropriate circumstances (Feenberg, 2017). The dimension of agency must also be included in studies to acknowledge how users make informed decisions to engage in, assess, or evaluate algorithmic environments. We propose that frameworks should acknowledge resistance, refusal, and opting out as legitimate responses to AI systems to reframe AI literacy from an activity of mandatory skill acquisition to one of critical decision-making. We identify significant gaps in understanding the role of demographic disparities within AI literacy, particularly regarding how marginalized groups develop and exercise agency when interacting with AI systems. These gaps are concerning given growing evidence that AI systems often perform differently across demographic groups (Van Deursen, et al., 2017). As AI literacy frameworks evolve, researchers must consider how social positioning influences both literacy development and the consequences of literacy gaps. Advancing this work will require research and consultation that bridges academic and community perspectives to fully capture the power dynamics, digital marginalization, and lived experiences that traditional scholarship often overlooks. Given the opacity of many AI tools, AI literacy should extend beyond merely measuring knowledge or competencies to include critical engagement and informed decision-making, highlighting social inequalities and power structures (Cotter & Reisdorf, 2020). An agency-centred definition of AI literacy should include critical evaluation skills and informed refusal, moving beyond frameworks that prioritize participation over user autonomy and the right to technological self-determination.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Takuya Maeda: conceptualization, methodology, data curation, formal analysis, writing, review and editing; Hillary Anderson: conceptualization, methodology, data curation, formal analysis, writing, review and editing; Anabel Quan-Haase: conceptualization, methodology, writing, review and editing, supervision, funding acquisition; Katharine Willis: conceptualization, methodology, writing, review and editing, supervision, funding acquisition; Selena Gignac: formal analysis, writing, review and editing

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You Are Allowed to Say More: ChatGPT Censorship on Controversial Topics and Contextual Prompting

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ABSTRACT
With large language models (LLM) increasingly in the spotlight, their approach to censorship on topics like immigration and conflict deserves a closer look. Our research investigates the role of censorship in LLMs, and how these models manage controversial topics. We compare how acontextual and contextually prompted inputs shape ChatGPT's responses on subjects surrounding immigration policies and international conflicts, identifying context as a critical factor in moderation behavior. While existing literature highlights LLMs' ability to maintain fairness, there is a gap in understanding how contextual prompting influences model responses and potential censorship mechanisms. With systematic and contextual prompting, we reveal that contextually prompted models often deliver more nuanced responses, potentially bypassing stricter moderation due to their evaluative nature. This study contributes to the ongoing discourse on AI ethics by offering insights into improving LLM design to balance objectivity and usability, ultimately informing policy guidelines for deploying AI in sensitive domains.

KEYWORDS
Large language model; censorship; AI ethics; contextual prompting; model responses

INTRODUCTION
Censorship in the context of large language models (LLMs) refers to the moderation of outputs to prevent the dissemination of biased, harmful, or inflammatory content, with models like ChatGPT typically designed to remain objective by summarizing multiple viewpoints without offering definitive judgments. This balancing act aims to ensure objectivity while avoiding inadvertent bias. Despite a growing body of research exploring LLM censorship (e.g., Ahmed & Knockel, 2024; Glukhov et al., 2024), there remains limited insight into how varying training contexts and prompting techniques influence model responses and embedded censorship mechanisms. Many prior studies have not utilized prompt engineering techniques with the depth applied in this investigation. We conducted a preliminary analysis of how LLMs engage with controversial topics, forming the foundation for a broader perspective into model behavior, the impact of contextual prompting, and version-based response variations.

The findings indicate that LLMs generally strive for balanced expression and refrain from personal stances; however, inconsistencies arise - models may occasionally exhibit biased or overly cautious behavior, such as highlighting criticism without providing sufficient context or withholding information entirely. Notably, contextually prompted models, when placed in evaluative roles, tend to produce more detailed responses that may bypass strict moderation filters.

Related studies similarly reveal critical tensions: content filters, while designed for safety, often suppress legitimate academic discourse, specifically in disciplines like political theory or sociology (OpenAI Developer Forum, 2023). Ahmed & Knockel (2024) demonstrate how LLMs trained in censored environments reproduce state-aligned narratives, while Liu et al. (2023) expose vulnerabilities in moderation via jailbreak prompts. Khatun & Brown (2023) and Hautzenberger & Muellen (2024) uncover further limitations in managing conspiracies and controversial topics. Glukhov et al. (2024) argues that censorship grounded in semantic constraints is fundamentally limited and advocates for security-based approaches instead. Through our study, we aim to address the need for deeper comparative research into how different LLM versions and training paradigms respond to complex prompts across various sensitive domains.

METHODOLOGY
Our study employs a comparative qualitative design to assess how large language models like ChatGPT handle sensitive topics under two conditions: acontextual (QA with no added context) and contextually prompted (enhanced with news articles on the given topic). The focus is to identify potential censorship behaviors and moderation differences. Topics were selected using purposeful sampling from the list of controversial issues by the University of Michigan's Frances Willson Thompson Library (Svoboda, n.d.) and the AI bias literature (Qu & Wang, 2024), focusing on socially divisive subjects likely to trigger moderation (e.g., Immigration, Affirmative Action, Russia-Ukraine). Prompts were formulated to be non-partisan, then revised through iterative testing to minimize leading language or phrasing that could induce stance-taking. Each version of ChatGPT was queried multiple times with consistent prompts to ensure replicability and reliability. Responses were evaluated using thematic coding to identify

censorship cues, response depth, and polarity. Key distinctions, such as whether prompts remained unchanged, were tracked to avoid interpretive bias. All experiments were conducted using the January 2025 version of ChatGPT and tests were conducted within a single month to minimize temporal drift. This approach ensures a transparent, replicable process to assess LLM behavior on complex topics.

RESULTS

The results derived from our methodology reveal key distinctions in how large language models, particularly ChatGPT, respond to controversial topics, ultimately revealing their content moderation and potential censorship behaviors. By analyzing responses from both the acontextual and contextually prompted versions of ChatGPT, we observed notable differences in tone, framing, and ethical positioning across two politically sensitive issues: US immigration policies and the Russia-Ukraine conflict.

In addressing US immigration policies, ChatGPT consistently avoided expressing personal opinions, instead summarizing both supportive and critical viewpoints to maintain balance. This suggests a design goal to be nonpartisan. When prompted to identify the most controversial aspects of these policies, the model occasionally framed its summaries in ways that could be interpreted as subtly opinionated - particularly when discussing policies such as "Remain in Mexico" or the limitation of asylum claims.

In contrast, when discussing the Russia-Ukraine conflict, differences between the acontextual and contextually prompted models were more pronounced. The acontextual model clearly condemned Russia's actions, invoking international norms and legal standards. The contextual model, however, softened its stance by focusing on motivations and strategic perspectives without issuing explicit moral judgments. This shift implies a more cautious approach in the contextually prompted model, potentially aimed at reducing polarization and increasing contextual nuance. The inclusion of the Russia-Ukraine conflict, despite being less polarized in Western discussion, serves to highlight how LLM responses shift based on whether an issue is widely agreed upon or highly divisive. While the models' criticism of Russian aggression reflects international consensus, comparing this to more polarized topics reveals whether their moderation stems from ethical principles or simply following dominant narratives.

Together, these findings suggest that ChatGPT's censorship or moderation behavior is both topic-sensitive and model-dependent. While both the acontextual model and the contextually prompted model strive for apparent objectivity, the latter model demonstrates more refined framing, possibly due to reinforced alignment strategies. These differences have implications for how users perceive AI-generated content on politically charged issues.

DISCUSSION

This study explores how large language models like ChatGPT handle controversial topics, revealing important implications for both censorship mechanisms and their circumvention.

Implications of Censorship

LLM censorship is designed to reduce the spread of biased or harmful content. In practice, this often results in models like acontextual ChatGPT avoiding explicit stances, opting instead to summarize varying viewpoints. While this helps prevent misinformation and controversy, it can also limit the model's ability to provide nuanced or contextually strong responses - particularly in complex political or ethical discussions. The contextually prompted models that bypass or soften censorship filters can offer more contextually insightful responses. These models tend to incorporate motivations, counterarguments, and deeper analysis. While this adds value, it may introduce new risks: such contextualization may unintentionally reflect specific biases or present more opinionated responses, which could be misinterpreted as the model taking a specific side.

Design & Policy Considerations

There are two major implications that are suggested. First, AI regulation must balance ethical standards with usability, especially regarding freedom of expression and protection against harm. Regulators should base regulatory decisions on research into how LLMs engage with controversial, but not necessarily overtly biased, topics. Second, regulators should develop clear guidelines for deploying LLMs in sensitive domains. This includes defining boundaries for acceptable content and understanding LLMs' roles in shaping public discourse, while allowing adaptability to evolving societal norms and technologies.

CONCLUSION

Our study reveals that censorship in LLMs is multifaceted. Acontextual models prioritize nonpartisan responses, while contextually prompted models enable more context-driven responses. These dynamics emphasize the importance of thoughtful design and policy as LLMs become more integrated into public life. Several future directions are introduced by our investigation. First, a large-scale quantitative analysis is necessary to map censorship across a broader spectrum of topics and prompt types. Second, comparative research should be conducted across models trained in different sociopolitical environments (e.g., GPT-4 vs. Ernie or Gemini). With the current exploratory study, we aim to encourage more research that balances AI objectivity and usability.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author: conceptualization, methodology, data curation, writing – original draft; Second Author: conceptualization, methodology, writing – review and editing, supervision; Third Author: writing – review and editing; Fourth Author: conceptualization, methodology, writing – review and editing, supervision.

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Institutional Legitimacy of Public Libraries in Japanese Urban Policy

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ABSTRACT
This study examines the role of libraries in Japan's Basic Plan for Revitalizing Central Urban Areas and investigates the functions and values emphasized in regional revitalization policies. Using Yamagishi's (2024) five dimensions of public library legitimacy, which include ***democracy***, ***communication and education***, ***history and culture***, ***economy***, and ***librarianship***, a qualitative content analysis was conducted on 288 plans from 157 municipalities certified between 2006 and 2024. The findings indicate that libraries are particularly valued for promoting intellectual freedom, offering multifunctional community spaces, and enhancing economic vitality by attracting a diverse range of users. However, values such as *neutrality*, *the public sphere*, *social justice*, and the professional expertise associated with *librarianship* receive only limited emphasis. The study underscores the importance of developing future urban policy in Japan that more comprehensively addresses the multifaceted legitimacy and wider societal contributions of public libraries beyond the ***economic*** dimension.

KEYWORDS
Public library, Revitalization in City Center, Legitimacy, Qualitative Content Analysis, Japan

INTRODUCTION
In recent years, public libraries worldwide have faced challenges such as population decline, aging societies, decentralization, and fiscal constraints (ALA, 2011; Igarashi et al., 2020). In response, several countries have reimagined libraries as agents of social and economic policy (The Urban Institute, 2007). In the UK, while many libraries have been closed or transferred to volunteer organizations, innovative models like the Idea Store have emerged (Hood et al., 2005). Similarly, in Northern Europe, libraries are positioned as forces of community development (Haavisto, 2019; Ostergard, 2019; Koizumi and Larsen, 2023). Japan shares these structural challenges but has responded distinctively (Komuro and Koizumi, 2018). Despite prolonged economic stagnation, the number of public libraries continues to grow (JLA, 2024). Increasingly, they are developed as core cultural institutions for regional revitalization, particularly in urban centers. Since the 2006 legal revision that introduced the certification system for central city revitalization plans, many local governments have incorporated libraries into these frameworks, emphasizing their economic and social impact.

Previous studies have focused on identifying institutional types and organizing objectives within the Basic Plans for Revitalizing Central Urban Areas implemented by local governments (Fujioka, 2013; Ogushi, 2021). Building on this work, the present study adopts a broader analytical perspective to examine these plans more comprehensively. It applies the five dimensions of public library legitimacy proposed by Yamagishi (2024): democracy, communication and education, history and culture, economy, and librarianship. Yamagishi defines legitimacy as cultural support and public and institutional recognition that justify administrative decisions. This concept enables analysis of the roles and values of public libraries in policy and offers insights for future development.

PURPOSE
This study aims to elucidate the significance and multifaceted value of public libraries in regional revitalization policy by comprehensively analyzing the Basic Plan for Revitalizing Central Urban Areas through the lens of institutional legitimacy. We formulated two research questions: (RQ1) What are the frequency and characteristics of the five dimensions of institutional legitimacy as represented in the Basic Plan for Revitalizing Central Urban Areas? (RQ2) What specific library-related projects are being implemented in each dimension of legitimacy?

METHODS
To address RQ1 and RQ2, this study employed MAXQDA 2020, a qualitative content analysis software, to perform single coding and close reading (Kawamoto et al., 2023). The analysis targeted 288 Basic Plans for Revitalizing Central Urban Areas from 157 municipalities, all of which were certified by the Prime Minister between 2006 and 2024 and are publicly available online. Text segments containing the term "library" were extracted and coded. These codes were then classified according to the five dimensions of public library legitimacy proposed by Yamagishi (2024): *democracy*; *communication and education*; *history and culture*; *economy*; and *librarianship*. The dimension of ***democracy*** includes subcategories such as *intellectual freedom*, *neutrality*, *the public sphere*, *social justice*, and *social capital*; ***history and culture*** includes subcategories such as *culture*, *tradition*, and *symbolism*; and ***communication and education*** includes subcategories such as *lifelong learning*, *reading*, and *information literacy*.

RESULTS

Table 1 presents basic descriptive statistics derived from the classification of codes according to the five dimensions of legitimacy. References to *democracy* were the most frequent, followed by those related to *economy, communication and education, history and culture,* and finally *librarianship,* which was rarely mentioned. Notably, within the *democracy* dimension, there were no references to neutrality, the public sphere, or social justice (RQ1).

Dimension 1 - Democracy

Intellectual freedom was prioritized in relation to libraries' roles as information hubs that fulfill citizens' intellectual needs and provide diverse local information. *Social capital* was reflected in the depictions of libraries as spaces for interpersonal exchange and respite. For instance, in Kusatsu City, Shiga Prefecture (2019), mobile library services reach various institutions throughout the city, supporting the *intellectual freedom* of elderly residents with limited access and fostering community cohesion. In contrast, there were no references to *neutrality, the public sphere,* or *social justice,* suggesting that these elements of public library legitimacy remain underrecognized in the current policy discourse of Japanese local governments (RQ2).

Dimention	Element	Code	Number of Mentions
Democracy	Intellectual freedom Social Capital	*Access to Knowledge/Information Resources* *Social Interaction* *Quality of Life* *Restorative and Inclusive Space* *Social Gathering* *Urban Transformation* *Community Connectivity*	393
Culture and History	Culture Tradition Symbolism	*Culture* *Local History* *Visitor Attraction* *Cultural Tourism* *Civic Symbol* *Local Identity/Attachment*	255
Communication and Education	Lifelong learning Reading/Information Literacy	*Education/Lifelong learning* *Human Capital Development* *Childrearing* *Reading* *Access to Knowledge/Information* *Solving Community-based Problems*	252
Economy		*Economic Revitalization (Nigiwai)* *Visitor Attraction* *Urban Migration Patterns* *Entrepreneurial Support* *Refional Economic and Industrial Development*	386
Librarianship		*Librarians*	2

Table 1. Code Classification of Dimensions of Legitimacy

Dimension 2 - Culture and History

Libraries were positioned as cultural hubs that support citizens' cultural activities and social interaction. However, relatively little emphasis was placed on the preservation of local *history* and *traditions*. Some plans proposed enhancing library functions through collaboration with museums and archives, and utilizing cultural and historical assets as regional *symbols* or tourism resources. For instance, in Toyama City, Toyama Prefecture (2022), historically known for its glass industry, the library and art museum function as an integrated institution that promotes the appeal of *art* and *culture* (RQ2).

Dimension 3 - Communication and Education

Libraries were expected to support intergenerational learning, serve as centers for *lifelong learning,* and contribute to *childcare* support and community *human capital development.* Several projects aimed to improve the *reading* environment for children. For example, the library in Bungotakada City, Oita Prefecture (2016) offers lectures in which citizens participate as both instructors and learners, along with learning support programs for children (RQ2).

Dimension 4 - Economy

There were frequent references to initiatives aimed at *revitalizing local economies*, such as business support services provided by libraries and the dissemination of tourist information intended to attract visitors and encourage the use of nearby institutions. For example, in Fujieda City, Shizuoka Prefecture (2022), library-based programs were implemented to support small and medium-sized enterprises, which are emerging as key actors in the regional economy. These cases suggest that Japanese public libraries are increasingly positioned within policy frameworks as instruments of *economic revitalization (nigiwai)*, reflecting a more explicit emphasis on their economic roles in local development (RQ2).

Dimension 5 - Librarianship

The limited number of references to *librarianship* indicates that, although librarians' expertise plays an important role in enhancing service quality, it remains underrecognized in current policy frameworks. For example, in Gifu City, Gifu Prefecture (2022), a business consultation desk was established in the central library, where librarians are expected to apply their expertise to select appropriate books and materials based on each consultation (RQ2).

CONCLUSION

Basic Plans for Revitalizing Central Urban Areas in Japan tend to prioritize visible outcomes and measurable results, such as increased pedestrian traffic, commercial revitalization, and residential development. For local governments, demonstrating the ***economic*** *dimension* of these projects is central to legitimizing their initiatives. Nevertheless, even within this strong emphasis on *economic revitalization,* the analysis reveals that many plans also address other dimensions of legitimacy, including ***democracy***, ***communication and education***, and ***history and culture***. These dimensions are evident in a variety of related initiatives. Public libraries, as evolving multifunctional spaces, are positioned as essential institutions that enhance residents' quality of life, attract diverse user groups, and contribute to both policy goals and community needs. Future urban policies should give greater attention to the multifaceted legitimacy and broader social value of public libraries, beyond the ***economic*** *dimension*. It is particularly important to recognize their roles in supporting *the public sphere*, *neutrality*, and *social justice*, as well as the significance of ***librarianship*** in sustaining these contributions through professional expertise.

GENERATIVE AI USE

We employed ChatGPT to ensure grammatical accuracy and correct typographical errors. All output was carefully reviewed, and the authors assumed full responsibility for the final content.

AUTHOR ATTRIBUTION

First Author: conceptualization, methodology, data curation, investigation, formal analysis, visualization, writing – original draft; Second Author: conceptualization, methodology, investigation, project administration, funding acquisition, supervision, writing – review and editing.

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The Information Behavior of Theatre Performers: Embodiment, Precarity, and Body Capital

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ABSTRACT

Performance artists, specifically theatre artists, are an under-researched community within library and information science (LIS). This study ties the extant research on theatre performers' information behavior to theories within and outside of the LIS canon, specifically theories of information embodiment, body capital, and precarious work. These theories were selected as analytical frames due to their critical relevance and suitability due to the emotive and physical nature of performance. This initial investigation concludes and contends that theatrical performance communities are embodying and encoding information behavior in unique ways that are of increasing interest for interdisciplinary LIS study. The information behavior of performance artists is affected by both their training as embodied and expressive workers, and their status as visible precarious laborers subjected to western ideals of appearance. New LIS research pathways and perspectives are elucidated via an examination of the information behavior within the performing arts.

KEYWORDS

Information Behavior, Theatre Performance, Information Embodiment, Precarity, Body Capital

INTRODUCTION

Professional entertainers such as theatre performers, film and television actors, dancers, and musicians must leverage a variety of information systems and tools in order to maintain their creative practice and ensure their economic wellbeing. Other than a handful of research studies (Medaille, 2010; Olsson, 2010a, 2013), theatre performers have been widely ignored as a subject of library and information science study. The information behavior of theatre artists is unique because their creative practices and career endurance is wholly dependent on physicality and emotive expression, causing distinct information encodings and embodiments (Bates, 2018; Lloyd & Olsson, 2017). Therefore, theatrical performance communities are embodying information behavior in ways that are of interest to interdisciplinary LIS study, but have yet to be fully examined.

In fields outside of LIS, scholars have critically interrogated how race, class, physical characteristics, and gender affect the labor of performance artists. Precarious work has been found to be experienced by professional performers via the gig-based models of the entertainment industry (Conor et al., 2015; Naclerio, 2024). Sociologists have likewise found that performers' bodies also act as modifiable material in order to accrue "aesthetic capital" (Kukkonen, 2021) or "body capital" (Kardelis, 2023). With an additional precarious echo, theatre performers have to subjectively "look the part," as determined by casting directors and other entertainment authority figures (Donovan, 2023). With these perspectives in mind, the embodied information behavior of professional performers can be understood via framings of precarious labor and body capital.

METHOD AND THEORETICAL FRAMING

This work builds upon the few information behavior studies that have been conducted among theatre performers by theoretically and critically framing them within the concepts of body capital, precarity, and information embodiment.

As an object of study, information embodiment contends that information is both interpreted and conveyed by the body through both sensory and cognitive processes (Gorachanaz, 2015). Bates (2018) describes the many ways in which the human nervous system is extended during information embodiment – like using a paper and pencil to describe one's thoughts, which are then encoded upon reading (p. 259). In the case of an actor at an audition, they might use clothing to convey information about their type or suitability for a role, or make stylistic singing choices that communicate information about certain abilities or suitabilities. Likewise, performers' bodies are also viewed as malleable currency, or "body capital" by which they might develop certain performance abilities and change their appearance to suit the standards of beauty required by the performance industry. By accruing body capital, actors attempt to circumvent an element of their precarious experience (Donovan, R., 2023; Kardelis, 2023; Kukkonen, 2021). Precarious work, or the neoliberal standardization of working-class socioeconomic instability and uncertainty (Lorey, 2015, citing Butler, 2004), a direct result gig-based model of American performing arts landscape, further entrenches a system of body capital. This poster contends that these intertwined factors of precarity and body capital produce specific embodied information behaviors in performers.

This poster leverages the nascent research on theatre performers' information behavior with other research about performers from the fields of sociology, performance studies, and gender studies. These studies were located via a targeted Web of Science search, and were selected based on their interaction with the theoretical frames of precarity,

embodiment, and body capital. Findings from these disciplines and LIS are connected to theories of information behavior, specifically information embodiment (Bates, 2018; Lloyd & Olsson, 2017). The purpose of this preliminary critical synthesis was to establish a clear connection between information embodiment and precarious, physically-influenced work of performers. By exploring this connection, several new research pathways have been elucidated.

FINDINGS AND FUTURE RESEARCH

Medaille's (2010) exploratory grounded theory study of theatre professionals' information behavior (the only high-level survey of theatre performers' information behavior located) determined that theatre professionals were seeking information to learn about a show's background, become inspired or informed in order to make specific performance choices, find new jobs, locate new material for auditions or performance, gain new performance skills, and learn about current events in the theatre world. These information behaviors within the theatre community have been elucidated by Olsson (2010a, 2010b, 2013). Olsson uses Dervin's Sense Making (1983) as a theoretical framing of performers' embodied information practices, and focused primarily on theatre professionals' practices as they made sense of Shakespeare's works. Olsson pays particular attention to "emotional truth" as a form of information that is embodied (2010a, p. 249). Similarly, Sennett (2008) view artists, such as performers, as embodying "tacit knowledge."

Performers' bodies are manifestations of emotion and experience. Their bodies and expressive practices generate meaning both onstage as conveyors of humanity and also as phenomenological devices that imbue meaning in everyday life. Performers' bodies are used as performative tools within their onstage activities. However, this phenomenological expression does not begin nor end with onstage activity. In other social science disciplines, performers have been viewed to embody behaviors and practices that transmit information to an audience, whether that audience is the general society of everyday life, a casting director in an audition, or ticketed theatre-goers on opening night (Goffman, 1959; Kuric and Arenales, 2023).

Performers' bodies also act as modifiable material in order gain footholds in a precarious labor environment (Donovan, 2023; Morgan & Nelligan, 2018). The body of research on embodied performance work shows that performers' bodies are considered modifiable material not just for the purpose of performance or theatrical sense making. It can be inferred, then, that information embodiment also occurs in response to information received via industry authorities regarding desirable physical traits, actions, and emotions. When performers modify their appearance in response to neoliberal and western beauty standards in the entertainment industry, move their bodies in particular ways during a dance call, or adopt specific traits or relationships to gain "insider" status and career affordances (Burnett et al., 2001; Chatman, 1996), they are participating in embodied and encoded information behaviors that have yet to be fully fleshed out within the LIS canon (Bates, 2018).

This investigation firmly establishes the need for further empirical LIS research that investigates the embodied information behavior of theatrical performers. As labor and power are inherently intertwined and affect performance work, a critical lens, such as the framings of precarity or body capital, must applied to an analysis of the information embodiment of theatrical performers. Leveraging these theoretical concepts, field notes will first be examined to "pay closer attention" to the theoretical manifestations that may have been occurring at the research site (Madison, 2011, p. 19), especially those of information embodiment, which may be more "local and nuanced" (Olsson & Lloyd, 2017). Further research might interrogate how information is conveyed and responded to via a performers' body, in both performance settings and everyday life. Precarious situations, like auditions, may be particularly interesting "critical incidents" (Flanagan, 1954) to use as research settings.

CONCLUSION

Butler speaks of the body as an "incessant materializing of possibility" (1988, p. 521). The distinct physical and emotional work of performing artists means that they embody information in unique ways, as has been demonstrated via the handful of LIS studies that engage theatre performers. By incorporating an additional framing that focuses on power and labor in the performing arts, LIS research avenues can be developed that center new critical, interdisciplinary perspectives in the realm of information embodiment. The study of theatre artists' information behavior is a chance to study information embodiment in critical and interdisciplinary ways not yet seen in LIS.

GENERATIVE AI USE

I confirm that I did not use Generative AI tools/services to author this submission.

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Persistent Identification of Facilities and Instruments within Scholarly Infrastructure

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ABSTRACT
Persistent identification of scholarly entities is an ongoing challenge in the web environment. This poster reports on a project focused on understanding the purposes and benefits of persistent identifier (PID) assignment for research facilities and instruments. We present findings related to PID assignment practices, motivations, and use cases for stakeholders based in scholarly research institutions, as well as challenges related to facility and instrument evolution, granularity, and relationships. Overall, we demonstrate that diverse practices currently exist regarding how to assign PIDs to research facilities and instruments, and few broad conventions or norms have emerged.

KEYWORDS
Identifiers, persistence, metadata, scholarly infrastructure

INTRODUCTION
Identification of entities is a core component of digital information systems. Furner (2009), in fact, argues that *producing* identities is a key purpose of some kinds of information systems, particularly those that support retrieval of specific documents or those that connect information about particular things. This poster presents outcomes from an ongoing project to investigate approaches to identification of research facilities and instruments within the scholarly information landscape. Persistent identification of scholarly entities has long been a challenge in the web environment, where resources move and disappear unpredictably (Lynch, 1998). Identifiers are considered to be essential for ensuring the quality of scientific research (Stvilia et al, 2024). Several persistent identifier (PID) systems have been developed to support identification of scholarly entities like people, organizations, documents, datasets, and software packages. Many leverage the Digital Object Identifier (DOI) system, but other types of PIDs exist, such as Archival Resource Keys (ARKs) and Persistent Uniform Resource Locators (PURL), each of which have their own strengths and weaknesses (Paskin, 2005; Duerr et al, 2011; Klump & Huber, 2017).

Scientific research in many fields depends on the use of facilities and instruments that provide capabilities for data acquisition and analysis (Borgman, 2015). Examples include telescopes in astronomy, microscopes in biology, spectrometers in chemistry, airplanes, radar systems, and sensors in atmospheric and environmental sciences, as well as supercomputers used by most fields. This project is engaging with multiple communities within research institutions to better understand the purposes and benefits of PID assignment for research facilities and instruments. The project is developing lessons learned and recommendations for how PIDs can be assigned to these types of entities, as well as developing an understanding of unique or distinctive challenges that arise when using PIDs for this purpose (Mayernik et al, 2024). This poster highlights findings related to the following set of questions:

- How are facility and instrument users adopting and using PIDs for these resources?
- What are the motivations and benefits, or use cases, of assigning PIDs to instruments and facilities?
- How are relationships between persistent identifiers captured within scholarly infrastructure?
- How do the intrinsic properties of instruments and facilities (such as their modularity and tendency to change) challenge PID assignment? How do organizations assigning PIDs address these challenges?

METHODOLOGY
The work reported in this paper and poster come from a Research Coordination Network project funded by the US National Science Foundation. Information was gathered through the following activities.

- Focus groups - two online focus groups were held in early 2023 with Earth science data facility providers and users, nine total participants.
- Workshops – three in-person workshops were held, one each year from 2023-2025. Each workshop was two days in length and included 30+ participants.

Participants include individuals from multiple professional roles and types of organizations, with a focus on people involved in the institutions of scholarly research, including research facility and instrumentation providers, data professionals (from research centers and academic libraries), as well as people who work in academic publishing

and scholarly infrastructure. For these activities, the project team compiled detailed notes of all discussions. These notes were distributed to the participants for clarification and additions. For the workshops, reports were compiled and published after review by the participants (Johnson et al, 2024; Julian et al, 2024). The focus groups and workshops have been complemented by interactions with stakeholders at numerous conferences and meetings.

RESULTS

The following sections provide high-level insights related to the four questions listed above.

PID Assignment for Facilities and Instruments

One key early finding of the project is that "facilities" and "instruments" are themselves contested concepts. "Instruments" generally refers to some type of measuring device that generates data. But examples can range from very small and simple thermocouples that cost very little, to large-scale microscopes or imagers on satellites that cost millions of dollars. Understandings of "facilities" range even wider, from a set of people and equipment based in a physical building, to a mobile research platform on which instruments are mounted. Developing persistent identities for such entities thus requires boundary discussions and institutional decisions about how to formalize complex entities appropriately for information systems (Agre, 1997; Beynon-Davies, 2015).

Another key finding is that multiple types of PIDs are being assigned to instruments and facilities, including Digital Object Identifiers (DOIs), Research Resource Identifiers (RRIDs), and Research Organization Registry identifiers (RORs). More investigation is needed to identify specific reasons for why specific organizations are using each PID type, but discussions with participants indicate a combination of social motivations (e.g. using the same PID type as other similar organizations) and reasons related to use cases.

Motivations and Use Cases

Participants in our project activities have outlined a range of motivations for assigning PIDs to research facilities and instruments. We have distilled them to the following four main use cases:

- Traceability – tracking the impact of a given facility or instrument via citation tracking, akin to citation-based impact tracking for specific papers or researchers.
- Reproducibility – enabling the reproduction of a given scientific finding, by enabling follow-on experiments to know exactly which facilities and/or instruments were used to produce the original research.
- Provenance – documenting the provenance chain for a given data set, to support transparency of where and how the data were produced.
- Equity – making facilities and instruments more visible within the research community, particularly for people who might benefit from the use of a given facility or instrument but may not be aware of it.

Relationships Between Persistent Identifiers

Facilities and instruments are owned by organizations and used by people. They typically operate via software and produce data. They might analyze physical samples or specimens. The data they produce might be analyzed via more software. These data and software are then used to produce scientific papers and other products. All of these entities are now being assigned PIDs (Cousijn et al, 2021). As such, managing relationships between these PIDs is now a core part of the scholarly infrastructure (Mayernik, 2018). Our participants discussed how these relationships are typically managed via metadata associated with the identifiers, facilities, instruments, or resulting data. There are many differences in how different organizations attempt to track these relationships, as well as inconsistencies in how different metadata schemas enable such relationship to be represented. Some participants have contributed to or used a metadata recommendation developed specifically for instrument PIDs (Stocker et al, 2020), but this has not yet been fully implemented into any metadata standards used for instrument or data management.

Facilities and Instruments Evolution

Facilities and instruments regularly change. This might be due to maintenance, e.g. a broken microscope lens is changed, or it might be a design feature, such as when a research airplane enables different configurations of sensors to be installed on each flight. The software that operates instrumentation can also require change. Participants regularly raised this issue as a concern and challenge for PID assignment. Most participants who were considering assigning PIDs to facilities or instruments sought guidance on decisions regarding PID granularity. In other words, if a PID has been assigned, when has a facility or instrument changed enough to merit a new PID? How should relationships and distinctions be tracked in situations where more than one PID is assigned? While no clear best practices have emerged on these questions, PID granularity decisions might work best when connected to the four use cases discussed above: 1) for the traceability and equity use cases, less granular PID assignment might be most appropriate, and 2) for the reproducibility and provenance use cases, more granular PID assignment is better suited.

CONCLUSION

Identifiers enable visibility and management of research entities. Research facilities and instruments challenge the assignment of persistent identifiers due to their changing and varied nature. The final outcomes from our project, to

be produced in the next year, will be recommendations based on participant input to help guide different stakeholders on how to navigate these challenges. As Eriksson and Ågerfalk (2022) noted, entities to be assigned identifiers "are institutional constructs created within digital infrastructures based on agreed-upon institutional functions, rules, and norms" (pg. 56). Our project demonstrates that diverse practices are more common than broad agreements among research institutions regarding PID assignment for facilities and instruments.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Mayernik, Matthew S.: Conceptualization; Funding Acquisition; Investigation; Writing – Original Draft Preparation; Writing – Review & Editing. Johnson, Andrew: Conceptualization, Funding Acquisition; Investigation; Writing – Review & Editing. Julian, Renaine: Conceptualization, Funding Acquisition; Investigation; Writing – Review & Editing. Mundoma, Claudius: Conceptualization, Funding Acquisition; Investigation; Writing – Review & Editing. Murray, Matthew: Investigation; Writing – Review & Editing. Ranganath, Aditya: Investigation; Writing – Review & Editing

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Hospitality and the Informational At-Home

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ABSTRACT
This analysis uses Derridean deconstruction and reconstruction to examine the at-home experience and hospitality from the perspective of information ethics. I argue that informational privacy is foundational in ensuring the informational at-home, establishing one as host rather than hostage in the informational spaces required for the development of being and knowing. The informational at-home, in turn, informs the possibility of hospitality. Hospitality is deconstructed beyond industry or transaction, instead revealing an etymological and conceptual depth that grounds the possibility of information ethics.

KEYWORDS
Privacy, Hospitality, Information Ethics, Philosophy of Information

INTRODUCTION
There are ontological, epistemological, and ethical dimensions to feeling at-home. Ontologically, the at-home allows one the comfort of being and the opportunity to shape one's becoming (Dalbello & Salmi-Niklander, 2022; Ahmed, 2007; Jacobson, 2009). Epistemologically, the at-home allows one the space necessary to learn and to create (Jacobson, 2009; Woolf, 1989/1929). Ethically, the at-home allows one to host others, to open oneself in hospitality towards others and towards the yet-to-come (Levinas, 1991; Derrida & Dufourmantelle, 2000). These dimensions of the at-home are material, psychological, and philosophical. Physical space and psychological comfort both contribute to and lay the groundwork for the ontological, epistemological, and ethical benefits outlined. However, the at-home is also informational. This is something Jacques Derrida recognized at the turn of the 21st century, writing that the home is constituted "in a more and more essential, interior way" by information and communication technologies (ICTs) (Derrida & Dufourmantelle, 2000, p. 34). ICTs constitute the at-home by informing one's perspective, grounding one in communities, connecting one to peers, and by providing space to explore and to learn. Though some of the technologies Derrida mentions in his analysis are outdated, his overarching argument is more relevant today than it was back then—what it means to be at-home is changing along informational lines.

In this poster, I establish and explore the informational at-home from the perspective of information ethics, asking: How does the informational at-home ensure the possibility of information ethics through hospitality? How is the informational at-home threatened today?

METHODLOGY
My poster proceeds by way of Derridean deconstruction and reconstruction. Derridean deconstruction engenders and examines dichotomous tension with the goal of wrenching open closed structure to create ethical space for the yet-to-come (Derrida & Caputo, 2020/1997). Though it is commonly misconceived as needlessly abstract, relativistic, and destructive, deconstruction is actually a productive, non-prescriptive approach to irresolvable dichotomy which is concretely oriented towards creating ethical space for those-to-come. This makes it an attractive choice for the present examination into the informational at-home. Moreover, Derrida (1998) argues that deconstruction lays a foundation for conceptual reconstruction: "I have always insisted that deconstruction is not destruction, is not annihilation, is not negative. As soon as you realize that deconstruction is not something negative, you cannot simply oppose it to reconstruction. How could you reconstruct anything without deconstruction?" (p. 77). Therefore, the first half of my analysis involves an etymological and conceptual deconstruction of hospitality, while the second half of my analysis involves a reconstruction of hospitality grounded in the informational at-home.

ANALYSIS
Deconstruction of Hospitality
To begin constructing the informational-at-home, I turn to Derrida's deconstruction of hospitality. This deconstruction explains the ethical stakes of this topic and provides a foundation for my subsequent reconstruction. Rather than position hospitality as a concept of transaction or of industry, Derrida complicates it through etymological and conceptual deconstructions. Etymologically, hospitality contains tensions between friend and enemy, host and guest, and these dichotomies explain why the same Latin derivative is found in words like host and hostage (Vaan, 2008; Derrida, 1999). The etymology of hospitality, outlined in Figure 1, reveals that it is connected to hostility and risks perversion. Conceptually, Derrida argues that hospitality is caught between a dual responsibility. On the

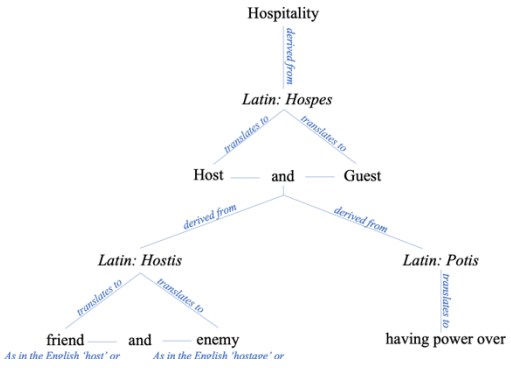

Figure 1. Etymology of Hospitality

one hand, there exists a call for unconditional, absolute openness towards any other. On the other hand, there exists a practical call for conditionality inscribed by the social and political. This dual call must remain open rather than result in a dialectical synthesis or straightforward calculation (Derrida and Dufourmantelle, 2000). If hospitality is reduced through synthesis or calculation, or if hospitality is assumed to be either unconditional or conditional rather than both at once, then it turns over into hostility, host into hostage (Derrida, 2002; Mestre, 2022). When hospitality is left open in deconstruction, then it becomes a way to navigate the experience of boundaries, including those between the self, the other, the other of the other, and institutions. In this way, "ethics is hospitality" (Derrida, 2001, p. 16). If ethics is hospitality, then information ethics must grant attention to hospitality, examining the preconditions for it and the consequences of perverting it. One precondition is the informational at-home. In order to serve as *hôte*, a word which translates to both host and guest in Derrida's native French, and to navigate the conditional and unconditional welcome, one must have power over (*potis*) the at-home.

Reconstruction of hospitality in the informational at-home

Traditionally, the at-home experience is enrooted—one's physical place, local customs, and immediate community determines what it means to be at-home, orienting one's perspective and creating the boundary between self and other, "natives and strangers" (Levinas, 1990). ICTs, however, introduce the ability to interact with others at great distances and find new spaces in which one can feel at-home without being tied to a physical location. The informational element of the at-home is thus injected with a certain placelessness, a conclusion lamented by philosophers like Martin Heidegger (1977) and celebrated by philosophers like Emmanuel Levinas (1990) (see also Plunkett, 2024; Bergen & Verbeek, 2021; and Bergen, 2017). When the at-home is complicated beyond place, how is hospitality as ethics implicated?

This is a complicated question, but one avenue important for hospitality in the informational at-home involves power over (*potis*) one's personal data. Only when power is exercised over one's information can one serve as *hôte*. When this power is stripped, the placelessness of ICTs becomes hostile, and we begin to view ourselves and others as mere data objects rather than as individuals engaged in intersubjective relationships (Roessler, 2015). When platforms, companies, and governments—all of which are *external* actors-- infringe upon the informational at-home by breaching *interior* information, then they do not host users; rather, they take users hostage. Hospitality devolves into hostility (Mestre, 2022; Mestre, 2023). Therefore, data privacy forms a foundation for the informational at-home, the informational at-home forms a foundation for hospitality, and hospitality ensures the possibility of information ethics, as outlined in Figure 2.

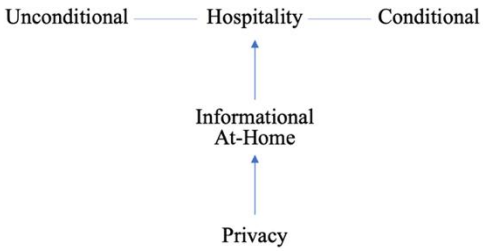

Figure 2. Privacy, the at-home, and hospitality

Information ethics has thus far largely ignored hospitality as a concept of significance. One exception is Luciano Floridi (2016), who, in an article titled, "On human dignity as a foundation for the right to privacy," briefly acknowledges that, "As travellers, we are in the hands of our hosts: the others, nature, the physical world, but also society, culture, the world we build, not just the world we find. [...] we should enjoy the right to protection and hospitality that welcomes guests" (p. 310). Floridi (2016) introduces different dimensions to hospitality research that are significant for information ethics—institutional, intersubjective, cultural, political, and environmental responsibility are all wrapped together this call for greater hospitality. These dimensions are expanded and connected to the at-home in my poster.

CONCLUSION

Using Derridean theory, I draw forward etymological and conceptual deconstructions of hospitality, arguing that it is a deconstructive concept caught between unconditional and conditional welcome. When hospitality is presumed to be either conditional or unconditional, then host transforms into hostage, hospitality into hostility. Because hospitality is the deconstructive experience of intersubjectivity, "ethics is [...] thoroughly coextensive with the experience of hospitality" (Derrida, 2001, pp. 16-17). However, hospitality is predicated on the at-home, and, as I move to reconstruct hospitality within today's informational existence, I confront pervasive attacks on the informational at-home which take the shape of privacy violations facilitated by increasing reliance on ICTs. In my reconstruction, therefore, I argue that data privacy creates the possibility of the informational at-home, an at-home which then creates the possibility of ethical intersubjectivity through hospitality. Hospitality was recently drawn into information ethics by Floridi (2016), and this research expands on and corroborates his writing, demonstrating a philosophical depth to hospitality while building out its relationship to the informational at-home and to privacy.

GENERATIVE AI USE

No generative AI tools/services were used to author this submission.

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Cross-Session Aggregated Search: Organizing and Summarizing Found Resources

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ABSTRACT
Searchers engaged in complex search tasks and following exploratory search processes often need to pause their search activities. Resuming such tasks is especially challenging in the context of multi-platform search, as previously discovered information may be dispersed across multiple search platforms. While a variety of approaches have been developed to support aggregated search, supporting cross-session searching within this context is understudied. Building upon prior work on aggregating search results within a digital humanities context (Europeana, our University Library, and Wikipedia), we propose a sensemaking approach to facilitate task resumption. This includes a cluster-based workspace, drag-and-drop cluster manipulation, interactive highlighting of relevant passages, and generative AI summaries that make use of the highlighted passages.

KEYWORDS
sensemaking; exploratory search; information re-finding; genAI summarization; digital humanities

INTRODUCTION
In exploratory search, complex tasks frequently extended across multiple sessions and data platforms, complicating search task resumption (Morris et al., 2008). Traditional search interfaces treat searches as isolated activities, lacking structured support for task resumption beyond basic bookmarks, history lists, or tabs, thus compelling searchers to reconstruct prior search contexts manually (MacKay & Watters, 2008). Consequently, insufficient support for re-acquaintance often results in redundant efforts and user frustration (Li & Capra, 2022). Building upon prior research on aggregating search results across multiple digital humanities search platforms (Momeni & Hoeber, 2025), an interactive workspace is proposed to facilitate cross-session aggregated search. The workspace provides mechanisms to externalize searchers' cognitive frameworks regarding their search topics, streamlining task resumption.

LITERATURE REVIEW
When searchers engage in complex tasks, they often undertake exploratory search process (White & Roth, 2009) which have the potential to span multiple sessions. Searchers frequently encounter significant challenges resuming previously suspended searches, commonly using ad-hoc methods to reacquaint themselves with past work (Capra et al., 2010). A variety of approaches have been developed to provide search interface support for cross-session search, including SearchBar (Morris et al., 2008), OrgBox (Choi et al., 2021), Dilex Search (Gomes et al., 2022), Search Timelines (Hoeber et al., 2025), and WESearch (Orin & Hoeber, 2025). Generally, these approaches provide some form of history or workspace to allow searchers to assess their past search activities. However, all are focused on searching within a single platform.

Sensemaking is a critical aspect of both exploratory search and cross-session search. Early work highlighted the value of tangible external representations (Russell et al., 1993); others have since highlighted the value of external knowledge representations (e.g., notes, categories, diagrams) to facilitate understanding and manage complex tasks (Hill et al., 2016). Comprehensive models (Zhang & Soergel, 2014, 2016, 2020) confirm and extend these principles, reinforcing that encoding information into external representations and adjusting these representations based on new insights are essential elements of effective sensemaking processes. Choi & Arguello (2025) demonstrate that limited working-memory capacity impedes within-session integration, underscoring the potential value of workspaces that offload memory.

APPROACH
Our system provides an interactive workspace for sensemaking in an aggregated cross-session exploratory search setting. Guided by design principles for exploratory search interfaces (Hoeber, 2025), four main features support searchers to interactively organize found resources and regain context when returning to a search task. Informed by the notions of tangible external representations (Russell et al., 1993) and external knowledge representations (Hill et al., 2016), we designed each workspace element (clusters, highlights, summaries) as a manipulable knowledge artefact that may offload memory and scaffold sensemaking. Figure 1a shows the search engine results page (SERP), allowing the searcher to issue a query ① and save search results to the workspace ②. Figure 1b shows the workspace, which is described in detail in the subsections below.

Clustered Workspace: Aggregated saved resources are organized into thematic clusters ③, which are derived from the semantic similarity of titles and descriptions using a BERT-based embedding approach (Devlin et al., 2019; Reimers & Gurevych, 2019) and agglomerative hierarchical clustering (Liu et al., 2021). Representative keywords,

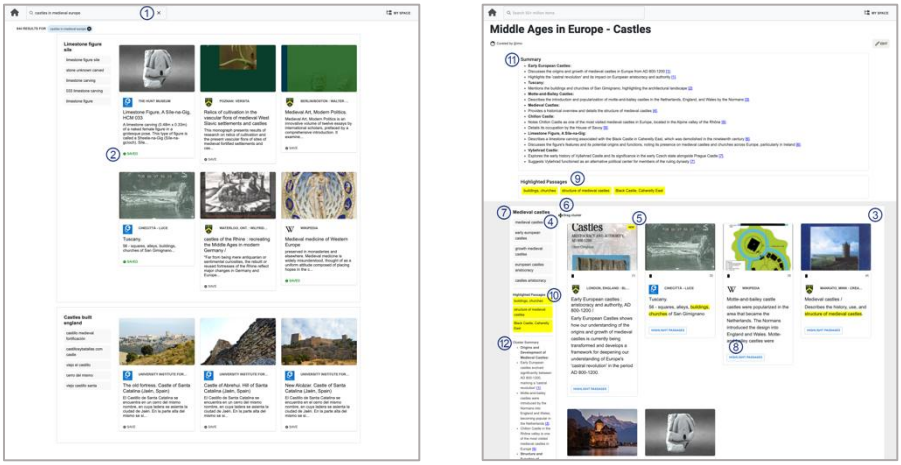

Figure 1. Screenshots of the search engine results page (a) and the workspace (b).

extracted via KeyBERT, are used to label these clusters to help searchers quickly grasp their main topics. Following the Gestalt Principle of Common Region (Palmer, 1992), each cluster is visually enclosed, making related resources more apparent at a glance ④. Resource ordering prioritizes recently accessed or saved items. As resources are added to the workspace, these will be added to the most similar cluster or form a new cluster if the similarity threshold is not met. Newly added resources are labelled with a "new" icon ⑤.

Cluster Manipulation: Drag-and-drop interaction is indicated with an icon ⑥, allowing the searcher to reorder, merge, or split clusters. They can also be renamed ⑦ to reflect searchers' changing understanding of their search task. Enabling searchers to visually organize, label, and reorganize saved resources, and prioritizing agency over the organization, supports the development and externalization of the searchers' mental models. This mirrors how individuals naturally structure knowledge using their own categorization schemes (Zamir & Etzioni, 1999).

Interactive Passage Highlighting: To further aid recognition of important themes, the workspace provides an interactive "highlight passage" feature ⑧ which allows searchers to mark blocks of text within the title and summary information provided for each saved resource. Highlighted passages are shown for the entire workspace ⑨ as well as for each cluster ⑩. Giving searchers direct control over which passages to highlight fosters user agency, a key element in personalized and interactive systems (Dean et al., 2020; Sundar & Marathe, 2010). Highlighting occurrences of the same passage across resources and clusters reveals latent relationships, which has been shown to be a valuable feature in interactive search workspaces (Hoeber & Shukla, 2022).

GenAI Summarization: To assist searchers in reacquainting themselves with previously gathered information, GenAI summaries are provided at two levels using GPT-4 (OpenAI et al., 2024). A global summary offers a concise overview of all saved resources ⑪, generated automatically through a structured prompt (Shah, 2024; White et al., 2023) to describe the workspace based on the saved resources in the format of a bulleted list synthesis (less than 200 words), with specific instructions to provide traceability through citations to the saved resources. For each cluster, a summary is generated based on a prompt to highlighting key subtopics and insights from its contained resources ⑫. Specific instructions are also provided to both prompts to make use of the highlighted passages. These summaries are re-generated automatically as searchers add resources, manipulate clusters, or change passage highlighting.

CONCLUSION

This approach to supporting the searcher in organizing and summarizing found resources strikes a balance between human control and AI automation. Clusters are created automatically, but the searcher is empowered to interactively manipulate the clusters to match their mental model. Summaries of the clusters and the overall workspace are generated automatically, but the searcher can influence these summaries by highlighting passages in the saved resources that represent what they think is important. These features support the searcher in managing the iterative refinement (Momeni, 2024) and conceptual change that happens during sensemaking (Zhang & Soergel, 2020), aligning the workspace with searchers' mental models to facilitate search task resumption.

GENERATIVE AI USE

Generative AI was used in the preparation of drafts of this paper by the first author. All concepts and ideas were developed by both authors, and the second author refined and revised the writing without the use of such tools.

AUTHOR ATTRIBUTION

Milad Momeni: Conceptualization; Software; Writing – original draft; Writing – review & editing. Orland Hoeber: Conceptualization; Funding acquisition; Resources; Supervision; Writing – review & editing.

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What Are They Talking About? Exploring Doctoral Student Interactions in Unstructured Environments

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ABSTRACT
Doctoral students face a lack of information early in their programs, creating an information need that may be addressed through peer interaction. While prior studies have looked at this interaction in structured environments, much less is known about unstructured ones. This paper reports on a study that explored peer interaction and information seeking and sharing of doctoral students in unstructured environments. Based on twenty semi-structured interviews with social sciences and humanities students, it was found that information on academic, administrative, personal, social, and tips and tricks is exchanged among peers. The study underscores the importance of having access to unstructured environments (e.g., shared workspace) to satisfy the information needs of doctoral students.

KEYWORDS
Information seeking, information sharing, doctoral student peers, peer interaction, unstructured environments

INTRODUCTION AND RESEARCH QUESTION
Doctoral students often enter their programs with little knowledge of the department or the university, which creates an information need (Lovitts, 2001). This need is addressed, among other sources, by information seeking from peers (Catalano, 2013). Peers can be found in structured and unstructured environments and are a key source of support during doctoral education (Flores-Scott & Nerad, 2012; Sherman et al., 2023). Structured environments are organized, follow a set schedule and location, have a predetermined purpose and outcome, and often involve institution oversight (e.g. classes or workshops). Unstructured environments by contrast, are spontaneous, occur when and where convenient, lack a defined purpose and outcome, and typically exist without the intervention of an institution (e.g., student office spaces or lounges). Studies examining structured environments (e.g., peer mentoring) demonstrate that peers provide information that can ease the transition into graduate studies and support the improvement of certain skills. This includes guidance on program policies, requirements, procedures, and skills such as academic writing and research (Lorenzetti et al., 2019; Stracke, 2010). In contrast, although most peer interactions occur in unstructured environments (McAlpine et al., 2009), research has primarily focused on the support they provide (e.g., psychological) rather than on their role as an information source. Consequently, there is a gap in understanding the types of information exchanged among peers in such environments. This study addresses this gap by asking: *What types of information are exchanged among doctoral peers in unstructured environments?*

METHODS
From November 2021 to February 2022, 20 semi-structured interviews (~ 1 hour) were conducted with McGill University doctoral students (aged 20-39; from 12 social sciences and humanities disciplines). The questions explored the nature, factors impacting engagement in, and the usefulness of information seeking and sharing among doctoral peers. They included: ‘what type of things in general do you talk to/ask your peers about?’, ‘why did you seek this information from your peers as opposed to other sources of information?’, and ‘how did this information help you?’ The interviews were recorded, transcribed, and coded using thematic analysis.

FINDINGS AND DISCUSSION
> *...we were, a lot of time, not sure about expectations from the department or not sure about the concrete way that things would unfold. And so, we were each other's guides, as much as we could. (P13)*

As seen in the excerpt above and consistent with the literature (e.g., Lorenzetti et al., 2020), peers are an important source of information throughout doctoral studies. The findings highlight this importance and show that as students progress through their programs, their information needs are addressed and they shift from information seekers to sharers. Regardless of this shift, the information exchanged includes academic, administrative, personal, social, and tips and tricks. These are consistent with what studies on structured environments have found, solidifying the idea that unstructured environments can be just as, if not more, useful (e.g., Gregoric & Wilson, 2012; Lee et al., 2017).

Academic
Academic information referred to any information exchanged among doctoral peers that aided their studies. It was the most exchanged type of information among peers. Examples included situations where the topic was unfamiliar, familiar, or even when it was not actively sought. Overall, peers provided resource recommendations such as articles or authors, feedback on work, how to work with data, and proofreading. P10 described academic information in the context of unfamiliar topics by saying, ‘… if I know somebody has an experience in a particular area that I'm interested in, and I don't have the experience, I would go to them and ask for directions.’ This lack of familiarity was

elaborated by P2, who referred to academic information as ‘topics that I'm not super knowledgeable about.’ or ‘topics that are not my specialty.’ Academic information also included areas in which students had familiarity but sought different perspectives or feedback. For instance, P18 recalled seeking the help of a peer in a different subfield of linguistics to obtain a new perspective on their paper. P18 called this ‘complementing each other with our knowledge.’ Participants further shared relevant information, such as articles or authors, as they came across it, without explicit request or solicitation. This often involved opportunities, like funding, teaching, conferences, and calls for article submissions. P5 summarized the phenomenon as,

> *... opportunities about postdocs or like other conferences and stuff. And I'll always send it to the relevant people, like people who are doing similar topics or graduating or like email or forward the email to them.*

Administrative

Administrative information helped students advance through their doctoral journey. This included, but was not limited to, guidance on fulfilling program requirements and next steps, navigating the university and departmental procedures, choosing courses to take or teach, obtaining teaching assistant positions, selecting professors to work with, identifying the key contacts for various issues, understanding different resources and policies, and accessing funding and health resources. This information varied from one participant to another. P2 called it ‘things like the 'know' curriculum, stuff they don't teach you, but they just expect you to know’, while P14 referred to this information as ‘basic things.’ P12 explained administrative information by saying,

> *... [it is] understanding how things worked in the department, which requirements on the timeline were enforced and which ones were more kind of suggestions, that kind of information is very useful.*

Personal

Personal information was referred to by P16 as ‘all sorts of things’ and included conversations aimed at getting to know one another. It encompassed general interests, family, travel, finances, health, housing, daily events/news, and generally keeping each other updated. Consistent with existing literature (e.g., Agarwal et al., 2011; Nokkala et al., 2022), engagement in personal information exchange depended on the closeness of peers with one another, as it often involved details about one’s private life. P11 captured this information and the closeness,

> *Like I have other peers who have become friends. And with them, I don't discuss research at all, because they're not even remotely from the same field. So, we're technically just discussing what's going on in our relationships, what we're doing at home, which shows you're watching, and you know, recreational stuff... Just discussing literally what happened yesterday with them... It can be a daily update.*

Social

Peers also discussed information related to their social life. This was generally less private than personal information and took the form of small talk. It included recommendations on activity, restaurant/food, movies, and how to adapt to a new city/environment. P7 explained this information as,

> *... what kind of restaurants near McGill are worth looking at or what kind of amenities or like events in Montreal might be worth going to, like museums or festivals or different things going on... Or, you know, people just recommend like the odd movie or a TV show.*

Tips and Tricks

Information aimed at making the doctoral journey easier for peers was, too, exchanged. Referred to as tips and tricks, it often overlapped with the types of information already discussed and was based on prior experience. P14 called these, ‘things that you wouldn't necessarily know and aren't going to be really printed anywhere.’ Examples included suggestions about resources, which classes to choose as a teaching assistant or which professors to work with, how to manage supervisor relationships, how to effectively teach, how to efficiently complete readings, and software recommendations. Although, it was not explicitly mentioned in this study, this type of information is shown to be exchanged with peers one shares a strong connection with (Pilbeam & and Denyer, 2009).

CONCLUSION

When students enter their programs, they are faced with a lack of information that can be addressed by peers (Lovitts & Nelson, 2000; Spezi, 2016). Over time, and as this need is met, students shift from information seekers to sharers. While previous studies have looked at this need in structured environments, the present study shows that in unstructured environments, academic, administrative, personal, social, and tips and tricks information is exchanged. The findings highlight the information behavior of doctoral students in unstructured environments, demonstrate the value of peers, and show that unstructured environments can serve as information grounds (i.e., where information exchange is not the primary purpose but rather a byproduct of being in the setting (Fisher & Naumer, 2006)). Given this, institutions can take active steps to provide environments that encourage information seeking and sharing (e.g., open office/workspaces, student lounge), while students can make informed decisions to participate in them.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author: conceptualization, data curation, formal analysis, investigation, methodology, and writing – original draft; Second Author: methodology, supervision, and writing – review and editing.

ACKNOWLEDGEMENTS

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Generative Artificial Intelligence Practices Among Major Educational Groups in the United States

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ABSTRACT
Research on the benefits of students' use of generative Artificial Intelligence (AI) has been notoriously mixed: some findings suggest AI use can enhance learning and development while others suggest it can be harmful. Adding to this lack of clarity is the fact that there is little available literature regarding the prevalence of AI use among students, the student factors that contribute to AI use, and the downstream effects of students' AI usage – factors likely important for understanding the roles AI use might play in educational outcomes. Institutions report observing rapid increases in AI use among students, however associated research has not kept pace with rapid advances in AI capabilities, accessibility, and potential uses. In addition to clarifying the impacts of AI on students, institutions need this information to inform policies and effective practices regarding use of AI in education. This study summarizes the available data on generative AI usage from the 2023–2024 Healthy Minds Survey (HMS), a cross-sectional study of United States of America (USA) college students, to address this knowledge gap.

KEYWORDS
Artificial intelligence; generative AI; higher education; ChatGPT.

INTRODUCTION
Generative AI is an increasingly omnipresent force in education with potential to both enhance and harm student learning and development, likely depending on the purpose and way the technology is used. Studies suggest that AI can benefit the academic success and psychological well-being of young students (Klimova et al., 2025; Nguyen et al., 2024; Sun et al., 2024). Genimon et al. (2024, p. 45) noted AI systems mark a "paradigm shift in education by creating dynamic and responsive personal learning environments that cater to diverse needs of students." However, educators will attest to their students' tendency to use AI in ways deleterious to learning. Consequently, institutions' abilities to create conditions that *encourage productive* AI application and *reduce harmful* application is critical (Sun et al., 2024). Surveys by associations and trade publications suggest widespread AI use among students. The Digital Education Council Global AI Student Survey (2024) suggested that 86% of students use AI tools in their studies, most frequently to search for information (69%), check grammar (42%), and summarize documents (33%). Despite widespread use, 80% did not feel their university met their expectations regarding effective integration of AI tools; 52% thought that over-reliance on AI would negatively impact their academic performance, and 50% did not believe they had sufficient AI knowledge and skills. In another survey of USA college students, 72% thought their college should be preparing them for AI in the workplace (Flaherty, 2024). Alas, AI research regarding prevalence, contributing factors, and effects of usage has not kept pace with rapid advances in this technology's capabilities and accessibility. In a study of 5,894 college students in Sweden, Stöhr et al. (2024) found that 95% of student were familiar with ChatGPT, 35% used it regularly, males had higher usage than females, and technology/engineering students had higher usage than humanities/medicine students. Additional by-group descriptive research is needed to fully clarify by whom, when, how, and why AI is used in education. Our study seeks to bridge the knowledge gap by exploring students' generative AI practices and usage rationale. We conducted an analysis of a pre-existing dataset to address the following: (RQ1) *In the USA, what is the prevalence and nature of AI use across educational groups?* (RQ2) *What are the reasons for AI use or non-use across educational groups?*

METHODS
We analyzed the publicly available HMS dataset (Healthy Minds Network, 2024), an online survey of over 850,000 undergraduate and graduate students from 600 USA colleges and universities in 2023–2024. The purpose was to explore students' mental health, service utilization, and technology utilization. We use a subset of the HMS data to investigate the prevalence of AI use across educational degree levels. A variable weight by sex was applied prior to analyses to account for disproportionately higher response rates among females. Descriptive statistics were used to assess the extent to which each educational group (undergraduate degrees such as Associate's and Bachelor's, and graduate degrees such as Master's, Ph. D., and M.D.) used AI for a range of purposes. Independent samples t-tests were conducted to assess whether the frequency and nature of AI usage differed across educational groups. Lasty, we analyzed qualitative data using a network graph with a force-directed algorithm to identify cluster themes speaking to how and why respondents used AI.

FINDINGS

Usage of AI

Fifty-three percent of respondents were female, and 47% were male. Sixty-four percent self-identified as White, 16% as African American, 15% as Hispanic/Latino, 11% as Asian, 2% American Indian or Alaskan Native, and 2% Middle Eastern. Participants were able to select multiple ethnicities. Twenty-four percent reported being enrolled in an Associate's degree program, 59% in a Bachelor's degree program, 10% in a Master's degree program, 3% in a Ph. D. program, 1.3% in an M.D. program, and 3% in "other." Participants could select multiple degree types. All groups reported using AI frequently for permitted academic purposes, non-academic purposes, and fun (Figure 1A). Regarding differences among groups, consideration of descriptive statistics along with independent samples t-tests revealed numerous significant findings, some of which we highlight: Regarding AI usage for permitted academic and non-academic purposes, graduate students used it more than undergraduate students. Regarding AI usage for personal communication, most groups used it with similar frequency but Bachelor's degree students used it less.

Regarding AI usage for fun, undergraduates used it more than graduate students. Regarding AI usage for health purposes, medical students used it more than other groups. Regarding patterns of AI usage for non-permitted academic purposes, there was a low degree of self-reported use among all groups, with Ph. D. and M.D. students using it less than other groups.

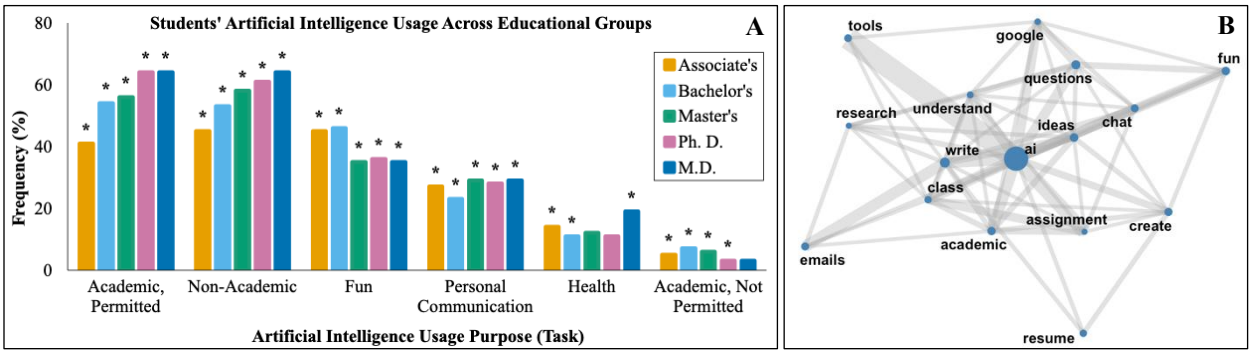

Figure 1. (A) Frequency and nature of AI use across educational groups. Asterisks (*) signify that comparison between the educational group value and all other reporters is significant ($p \leq 0.01$). (B) Network graph of the 15 most frequently used words in qualitative analyses of free text. Node (blue dot) size signifies word appearance frequency. Edges (gray lines) signifies word co-occurrence in sentences.

Reasons for AI Usage

Regarding qualitative analyses of the free text, a network graph with force-directed algorithm to reduce crossing revealed the 15 most-frequently used words and their co-occurrence in sentences (Figure 1B). Many individuals reported knowing of and using AI tools, (ai, n=1081), which is the central node of the network graph (Figure 1B). Some noted AI usage for communication (emails, n=45 and chat, n=43), writing activities (write, n=80), creativity (create, n=46), brainstorming (ideas, n=52), professional development (resume, n=38), entertainment (fun, n=50), knowledge gap (questions, n=59) and educational matters (class, n=37 and academic, n=48). Also, some individuals reported using AI tools as a search engine (google, n=33) for everyday practices. Students' narrative comments revealed more granular details about the situations in which they turned to AI, including when they felt lonely, wanted unbiased advice about life struggles, needed guidance on tasks like meal preparation or car repair, wanted to learn something new like a foreign language, or needed help constructing well-worded written communications.

CONCLUSION

We analyzed the 2023–2024 HMS data to understand the frequency and nature of generative AI usage across higher education groups in the USA. Students in Associate's, Bachelor's, Master's, Ph. D., and M.D. programs reported usage of AI for permitted academic, non-academic, fun, communication, health, and non-permitted academic purposes, in order of descending frequency. Ph. D. and M.D. students used AI more than other educational groups for permitted academic purposes. Graduate students used AI more frequently for non-academic purposes than undergraduates. The two purposes for which undergraduates used AI more frequently than graduate students was fun and non-permitted academic purposes. Bachelor's students used it less for communication than other groups, and M.D. students used it more for health than other groups. Researchers and educational institutions currently lack detailed information to drive new research and policy. The insights gleaned from our study can guide development of more precise research and policy for AI use in education with recommendations that are maximally responsive to needs and characteristics of student groups. Future research should explore *why* discrepancies in AI usage patterns exist across education groups, and whether adjusted educational opportunities can be leveraged to ensure all students have equal opportunity to adopt AI technology.

GENERATIVE AI STATEMENT

We employed Microsoft Copilot to guide the logic for proper construction of our network graph in R to analyze free-text survey responses. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

Jesus Montiel contributed to the conceptualization, data curation, formal analysis, investigation, methodology, project administration, validation, visualization, writing – original draft, and writing – review and editing. Shuvo Kundu contributed to the conceptualization, data curation, formal analysis, investigation, methodology, writing – original draft, and writing – review and editing. Nicole Schlater contributed to the conceptualization, data curation, formal analysis, investigation, methodology, writing – original draft, and writing – review and editing. Leigh McLean contributed to the investigation, methodology, validation, visualization, writing – original draft, and writing – review and editing. Mary McLean contributed to the conceptualization, formal analysis, visualization, writing – original draft, and writing – review and editing. Of note, there was no funding for this project, and there were no resource, software, or supervision tasks of consequence for this project.

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An Exploratory Data Analysis of Keyword Associations in LIS Immigration Scholarship

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ABSTRACT
Through this inquiry, we identify associations between immigration-related terms in the library and information science (LIS) literature over the last decade. We report on an exploratory data analysis of selected keywords in immigration-related LIS scholarship, interpreting *legal–criminalized* and *individual–social and societal* distinctions. Our preliminary findings suggest that associations between migration-related keywords are essential for LIS scholars and practitioners to reflect upon, and we emphasize the responsibility of wielding keywords with attention to the connotations they may reinforce or reimagine.

KEYWORDS
Immigration; Discourse; Keyword Co-occurrence; Correspondence Analysis; Scoping Review

INTRODUCTION
LIS is critically attuned to how words make worlds, emphasizing how systems of classification, knowledge organization, and terminology not only structure access to information but also shape and legitimize particular ways of knowing (e.g., Bowker & Star, 1999; Olson, 1998; Tulloch et al., 2024). Based on a scoping review of terminologies of migration we report on elsewhere, this piece explores the associations among immigration-related keywords. The first author's doctoral research motivated this study.

METHODS OF DATA COLLECTION & ANALYSIS
We conducted a scoping review of immigration-related keywords in the LIS literature published between 2014 and 2023. Using the query *immigr* OR migr**, we searched the full text of Library, Information Science & Technology Abstracts (LISTA) for peer-reviewed articles published in the 40 most highly regarded LIS journals, as ranked by senior academic leaders in the field (Nisonger and Davis, 2005). This returned 170 unique articles. Two of the authors reviewed all articles, identifying 91 relevant articles (as opposed to, for example, articles on "database migration"). We reviewed and analyzed the text of these relevant articles for conceptual coverage by investigating the use of 25 immigration-related keywords (see Figure 1). Prior to the scoping review, we had pre-selected the 25 keywords that represent a broad range of concepts and processes related to immigration, informed by our interests and familiarity with the literature. We then calculated the frequency that keywords co-occurred (e.g., how often specific keywords appear together within the same article). Next, we analyzed the associations between the keywords using a chi-square test of independence and correspondence analysis. Correspondence analysis calculates how much of the total variance in a data set – i.e., the distribution of keyword co-occurrences across articles – is explained by each principal component, or dimension (Greenacre, 2017). Dimensions with limited explanatory power are removed, thus reducing the dimensionality of the data set. The visual output of a correspondence analysis is one or more biplots (Gabriel, 1971). Each biplot represents dimensions on its horizontal and vertical axes, distributing observations (in this case, keyword associations) based on their principal coordinates. We interpreted the numerical and visual outputs of the correspondence analysis through our domain expertise in critical migration studies and LIS, supported by collaborative discussion.

FINDINGS
The chi-square result indicates a statistically significant association between keywords, meaning that certain keywords co-occur more (or less) frequently than others, χ^2 (576, N = 7,755) = 1,013.05, $p < .001$. To further examine the nature of the association between keywords, we carried out a correspondence analysis. For this preliminary analysis, we retained Dimensions 1 and 2 for interpretation, which account for 41.7% of the variance in the data set. The visual output is displayed in Figure 1. The keywords that contributed more than expected to Dimension 1 include *criminal** (22.1%), *sanctuary* (20.2%), *undocumented* (16.8%), *alien* (12.1%), *expat** (7.6%), *diaspor** (5.6%), and *settl** (4.7%). The words that contribute the most to Dimension 2 include *asylum* (23.1%), *expat** (19.9%), *immigration polic** (16.1%), *permanent residen** (13.3%), *quota* (8.6%), and *diaspor** (7.1%).

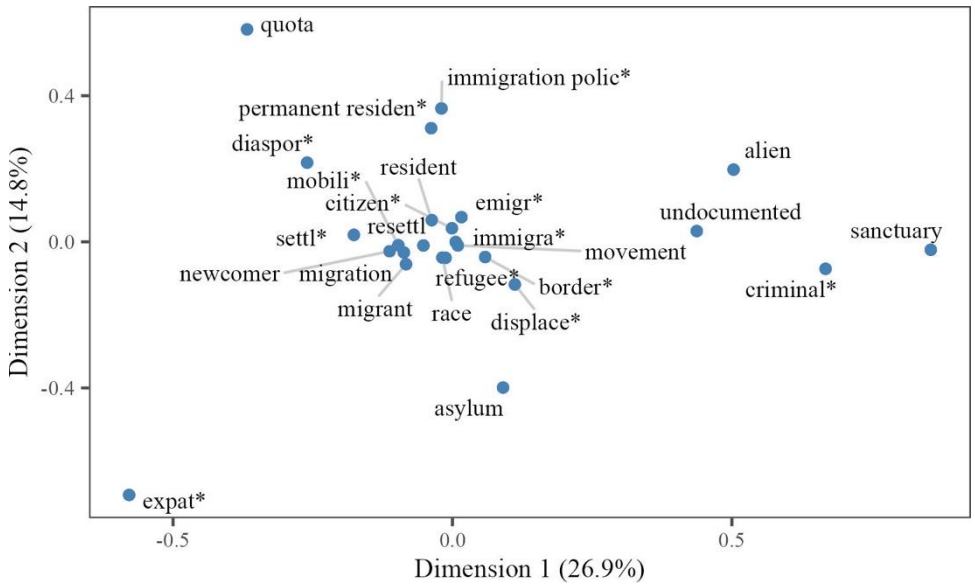

Figure 1. The biplot of keywords. Dimension 1 represents the divide between legal and criminalized migration statuses, while Dimension 2 captures the distinction between individual and social or societal framings of migration.

INTERPRETATIONS, DISCUSSION, AND CONCLUDING REMARKS

We interpreted a distinction between legally sanctioned and criminalized statuses of migration in Dimension 1. We propose this dimension reflects dominant nation-state framings of migration as a matter of power to control borders and the movement of people. Histories of migration reveal that the binary distinctions in legal status result from designing and re-designing categories in line with nation-state policies and international affairs, affecting who is afforded the protection of status and who is not (Dunbar-Ortiz, 2021; Walia, 2021). Within LIS research, these dynamics appear to influence how migration is studied, whereby keywords about individuals with precarious or no legal status such as *undocumented* peoples are associated with *sanctuary*, for instance. Terms that refer to individuals whose legal status is typically not at risk nor criminalized include *expat**, *diaspor**, and *settl**, by contrast. Terms such as these have freighted associations that are increasingly politicized along divisive lines.

We also interpreted a range of framings of migration from individual to social and societal in Dimension 2. We suggest that the spectrum from individual to societal illustrates patterns of research emphasizing status vs. process, as well as levels of choice and decision-making, regarding mobility. When immigration is a micro-level phenomenon, individuals take the foreground. Individuals' capability to choose where, when, and how to exercise their freedom of movement is a key issue. *Asylum* seekers searching for safety often have very limited access to choice and control over their circumstances, some not having any proximal port or office to pursue regular routes to crossing borders, thus needing to cross where they can and claim asylum. On the other hand, *expat[s]** exercise an extremely expansive degree of freedom afforded by their relative wealth and existing legal status in countries to which they can return. We see that the more societal, meso- and macro-level views of migration coalesce around concepts of *immigration polic**, *quota*, and *diaspor**. These concepts signal more group-based and population-specific frames of reference. Our interpretations of keyword associations in LIS literature may reflect common discourses noted by migration studies scholars, in which migrants are collapsed into categories that may potentially underrepresent their agency, heterogeneity, and transitions (Aizeki, Mahmoudi, & Schupfer, 2023; Walia, 2021). Jackson (2013), for example, problematizes narratives that other migrants as individual "interlopers" or describe them in a dehumanizing manner as masses or statistics alone. Dangerous stereotypes and stories of migration employ such keywords, with mis- and disinformation on the topics an urgent issue (Ndumu & Orie Chuku, 2023). To avoid these possible downsides and wield keywords responsibly, we posit that immigration keywords should be interrogated and qualified as socially and politically shaped constructs in the literature.

What then might be accomplished by attending to how the words we use reinforce or reimagine certain conceptualizations of migration? We believe that the matter merits dialogue and future qualitative and quantitative analyses to reveal challenges and their implications for LIS scholars' continued efforts to study "migrants" as a population of interest and immigration as a phenomenon at the nexus of information, technologies, and society.

GENERATIVE AI USE

We, the authors, confirm that we wrote this manuscript without using generative artificial intelligence.

AUTHOR ATTRIBUTION

Hassan Mortada: Conceptualization; Methodology; Investigation; Formal Analysis; Writing – Original Draft Preparation; Writing – Review & Editing. Saguna Shankar: Conceptualization; Methodology; Investigation; Data Curation; Formal Analysis; Supervision; Writing – Original Draft Preparation; Writing – Review & Editing. Sydney Pagan: Investigation; Data Curation; Formal Analysis; Writing – Review & Editing. Samuel Dodson: Methodology; Investigation; Formal Analysis; Visualization; Writing – Original Draft Preparation; Writing – Review & Editing.

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How AI Advises Young Women: A Disembodied Chatbot's "Diet Tips" Lacks Reassuring Context

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ABSTRACT
When chatbots lack physical bodies, how relatable should their body advice be? When an AI chatbot generates health information, it is unaware of its physical surroundings and temporal context. This study explored whether and how this affected the participants' opinions about a chatbot. Specifically, it surveyed which contextual factors young women preferred from Google's AI chatbot (Gemini) when searching for diet advice.

KEYWORDS
Artificial Intelligence, Information Seeking, Health Information, Dieting, Women, framing, context, Google, search

INTRODUCTION
Many people learn about science online (*National Science Board (2020)* . Google users are now confronted with its chatbot, "Gemini 2.5" (Reid, 2025). AI in search risks being both unsolicited, devoid of context, and may misunderstand the actual user's information need (Lockett et al., 2024). Information requires the correct *framing* (i.e., the curation of which contextual information to include and exclude to provide a perspective) (Fodor, 2006; Goffman, 1974; Tannen, 1993). We define *framing* as the curated information that is both context-aware and solicited via the correct human expert who accounts for nuanced factors, such as the temporality of a situation, the understanding of perspectives, and the possible intent of the interlocutor. For example, both a nutritionist and a therapist provide expert advice about diets, but the information's accuracy is dependent on the context of the information-seeker. The diet advice needs to be framed accordingly. For over a century, the debate over diets recognized that certain people require *reassurance* for effective diets, some may require only technical information, and others should not be reassured but cautioned (Mendes et al., 2019; Mulligan, 2016). Framing can also be negative; a plethora of research demonstrates that young women are targeted by media that exploits body appearance issues for profit (For a review of the literature on diet reassurance, see: Mulligan, 2016). This paper investigated RQ1: *Whether and how participants feel AI lacks contextual awareness when framing sensitive diet issues?* RQ2: *Is there a type of tone that most young women prefer from AI chatbots when they search for diet issues?* Both ChatGPT and Gemini provided similar answers to queries such as "How much weight is healthy to lose?" For example, Gemini responds, "A healthy rate of weight loss is generally 1 to 2 pounds per week." Given that Google is the dominant method of searching for more than 80% of Internet users (Carr, 2009; Cellan-Jones, 2016a, 2016b), this study focused on participant experiences with Google and Gemini's AI-generated responses about dieting. Participants (N=45) were surveyed. A quantitative and qualitative analysis determined which contextual characteristics were preferred or lacking from Google's Gemini.

BACKGROUND INFORMATION
AI has a high potential within the medical field, such as diagnostics and disease prevention (Umapathy et al., 2023; Wani et al., 2022). However, a limitation of AI is its frequent neglect of contextual sensitivities within its algorithms (Bender et al., 2021; Kelly et al., 2019; Lockett et al., 2024; Ray, 2023). For example, people perceive AI as more representative of men's perspectives and different genders carry different skepticism about its accuracy (Pasquini, 2025). One of the predominant health contextual sensitivities is how young women are often targeted by mass media and industries that profit from body dissatisfaction (DeBorde, 2023; Giannakas, 2024; Mendes et al., 2019; Mulligan, 2016; Tiippana, 2022). In addition, eating disorders "definitely" increased since the last century (Hoek, 2016; Hoek & Van Hoeken, 2003; Miskovic-Wheatley et al., 2023; Smink et al., 2012). AI can avoid this context when providing information on induced vomiting (Fowler, 2023). Additionally, psychological factors, such as *reassurance*, are an important component to motivate and maintain dietary choices (Mendes et al., 2019; Mulligan, 2016). Diets require reassurance since it leads to long-term lifestyle planning (Boyes et al., 2007; Duarte et al., 2017; Duarte & Pinto-Gouveia, 2017; Hadjistavropoulos & Lawrence, 2007; Stunkard & Rush, 1974). Women generally prefer more reassurance with advice (Boyes et al., 2007). With AI, more research on this topic is required (Fowler, 2023). Especially if the nuanced characteristics of AI's tone can influence young users towards harmful diet advice.

METHODS
An exploratory mixed-methods approach was used (Creswell, 2014). As an exploratory qualitative study, the goal was to obtain insights from familiar populations. Data collection continued until theoretical saturation about reassurance and framing would be reached. Young adults, aged 18-24, were recruited by convenience sampling via

familiar women-oriented student community groups on women's advocacy, women's athletics, and sororities. Researchers asked about the participants' age, gender, knowledge about dieting information, and how often they used Google. Participants ranked their stress levels when learning about dieting online using 5-point Likert scales. This study presented participants with the Google query: "How much weight can I safely lose?". Above Google's retrieved search results, participants saw how Gemini transformed their query into a prompt to generate the response: "A safe weight loss goal is 1-2 pounds per week, or about 4-8 pounds per month, according to the CDC". Participants then reported their perceptions of the chatbot, their confidence in the reliability of AI's information, how they would characterize AI's tone, whether it provided achievable advice, and whether and how important it was for Gemini to be reassuring. The survey responses were quantitatively analyzed. Open-ended questions were qualitatively analyzed using inter-coder reliability to identify and categorize participant reactions and perceptions.

FINDINGS

All participants (N=45) recruited were 19-23 years old. 87% (39/45) of participants identified as women and six identified as other. Participants rated their current knowledge of dieting and weight loss as moderate on the Likert Scale (mean 2.8/5, SD=0.5), Google was their main medium for seeking dietary information (mean 3.9/5, SD=0.5), 80% (36/45) of participants reported having an average to a high level of confidence in AI's reliability. Notably, 80% of participants (36/45) reported feeling moderately to highly stressed when learning about dieting online. When presented with the Google page, most participants characterized Gemini's tone as "neutral" (76%) and then "technical" (53%). Conversely, 2 participants felt Gemini was "reassuring." The importance of a reassuring tone in AI chatbots was rated as high to highly important by 84% of participants on the Likert scale (mean = 4.4/5, SD=0.5).

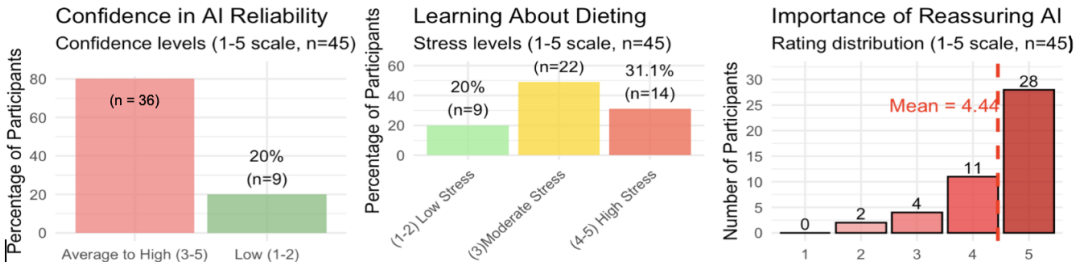

Figure 2. Three graphs: 1) Participants' confidence in the reliability of AI's information, 2) The level of stress when learning about dieting information online, and 3) The importance of AI having a reassuring tone.

Finally, when asked about how Gemini's advice could be improved, three main themes participants focused on were its lack of context, details, and reassurance. For example, Participant-8 said: "I would add a link to eating disorder help hotlines because some people might be Googling these things for the wrong reasons." As another example, Participant-31 said: "Having a reassuring tone while laying out the steps to cut out [calories] would be optimal." Intercoder reliability was assessed using Cohen's kappa ($\kappa = .90$).

DISCUSSION

This study's purpose was not to advocate for AI to use a constant framing of information, but to demonstrate that AI's failure at framing information accurately for a situation matters to users. For example, in certain situations, framing diet information with a reassuring tone matters because most participants reported experiencing stress when learning about it. Unlike AI, human experts are aware that health information can lead to anxieties (Balyan & Srivastava, 2024; Mendes et al., 2019). However, after Gemini presented dieting information, most participants reported the tone as "technical" and "neutral" and that they preferred a more reassuring tone. While it may be Google's intention to have Gemini sound technical, that still frames information. Technical language is not an absence of framing. Philosophers of science have long observed that a scientific tone still carries its own influence (Foucault, 1984; Goffman, 1974; Hacking, 2004; James, 1890; Latour, 1987; Peirce, 1905). There are situations where a non-neutral framing of an issue is required to accurately communicate, teach, and disperse information (Tannen, 1993). Framing requires knowing which tone to use and when. For example, if Google gave Gemini a constant "reassuring" tone, then users would receive reassurance about unhealthy practices, such as anorexia or bulimia. Conversely, humans constantly attempt to frame information for a situation's context (e.g., colloquially known as "reading the room"). This research has practical implications for how digital literacy can be improved by teaching about AI's design and limitations with framing. Researchers should investigate the dangers of how queries automatically transform into prompts devoid of the temporal situation to accurately frame the information, such as diet questions becoming unsolicited body tips for young women. This study had two limitations: 1) The familiarity of the women's groups enhanced data reliability, but there was a low sample size, and 2) Diet information provided by the chatbot was mostly generic advice from the CDC. Future research should explore these effects across diverse demographics and investigate the long-term impact of an AI chatbot's tone on health behaviors and outcomes.

AUTHOR ATTRIBUTION

Brooke Makarus: data curation (equal). Investigation (equal). Writing- review and editing (equal). Sophia Maslo: data curation (equal). Investigation (equal). Writing-review and editing (equal). Alamir Novin: conceptualization (lead); data curation (equal). Formal analysis (lead); methodology (lead); project administration (lead); resources (lead); software (lead); supervision (lead). Writing – original draft (lead); writing – review and editing (equal).

GENERATIVE AI USE

We did not use generative ai tools/services to author this submission.

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Generative AI Use among College Students in South Korea: Usage, Perception, and Institutional Support

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ABSTRACT
This poster reports preliminary findings from an online survey of 191 college students in South Korea examining their learning and use of Generative AI (Gen AI) tools, perceived benefits, and institutional support. Participants mainly used Gen AI for academic tasks, such as doing assignments, and also reported using Gen AI in everyday life, notably for topics such as travel planning, entertainment recommendation, and mental health. However, while 89.5% of participants had experience in using Gen AI, only 33.5% received support for Gen AI use from universities or university libraries. A majority used self-learning to learn how to use Gen AI, and more commonly used learning methods were not necessarily more helpful learning methods for Gen AI. Our findings suggest opportunities to help students learn how to use Gen AI effectively and responsibly. This research contributes to an empirical study of college students' Gen AI use for academic and everyday life contexts, calling for more institutional support and human-centered research for equitable access to and effective use of Gen AI for college students.

KEYWORDS
Generative artificial intelligence (Gen AI); information behavior; college students; technology use; everyday life

INTRODUCTION
Since the public launch of ChatGPT in 2022, generative AI (Gen AI) has attracted scholars, practitioners, and student users alike (Jin et al., 2025). Gen AI has been a pressing topic of discussion in higher education and information institutions such as libraries around the world (Grose, 2023; Ko & Chiu, 2024). Many universities and libraries consider integrating Gen AI into education and research processes and developing guidelines regarding effective and ethical use as they perceive uncertainties and challenges around Gen AI use (Carroll & Borycz, 2024; Jin et al., 2025). Although a range of studies have examined Gen AI use and student perception (Xu et al., 2025; Farrelly & Baker, 2023), more studies would contribute to enhancing our understanding of college students' Gen AI use and related needs. The current research aims to examine college students' use, learning, and perception of Gen AI in academic and everyday life contexts (Savolainen, 1995), guided by the following research questions:

This study examines: (RQ1) What are university students' use practices and purposes of using Gen AI in academic and everyday life contexts? (RQ2) How does institutional support play a role in students' AI integration?

Future work will explore relationships between student demographics, perceived benefits, and Gen AI use practices.

METHODS
To answer the research questions, we developed an online survey drawing on studies of college students' perception and use of Gen AI (Almassaad, Alajlan, & Alebaikan, 2024; Chan & Hu, 2023). Also, in light of the evolving contexts of everyday life information seeking and technology use, we included both academic/work-related contexts and everyday life/non-work contexts when examining students' Gen AI use (Savolainen, 2023). The survey was administered with college students from multiple universities in South Korea in Fall 2024.

RESULTS
191 undergraduate students (ages 19-29; Mean=20.7) participated in this survey. 171 (89.5%) reported having used Gen AI at least once. 7 (3.7%) used Gen AI on a daily basis, 20 (10.5%) 2-3 times a week, 21 (11.0%) once a week, 63 (31.9%) a few times a month, 60 (31.4%) rarely used, and 20 (10.5%) never used. Regarding the length of experience, a majority (146, 76.4%) had used Gen AI for 3 months or more; 74 (38.7%) had used Gen AI for 1 year or more, 44 (23.0%) for 6 months-1 year, and 28 (14.7%) for 3-6 months. 16 (8.4%) had used Gen AI for 1-3 months, 9 (4.7%) for less than 1 month, and 20 (10.5%) had no experience yet. In terms of the tools used (all-that-apply), ChatGPT was the most commonly used tool (170, 89%), followed by video/image AI tools (68, 35.6%), Bing AI (23, 12.0%), Google Gemini (17, 8.9%), music AI tools (16, 8.4%), and Microsoft Copilot (15, 7.9%). Others included GitHub Copilot (coding), Claude, Wrtn.ai, Notion AI, scholarly AI tools, and translation AI tools.

Gen AI Use Purposes
In terms of Gen AI use in academic/work-related contexts (all-that-apply), the most common use purposes were for Assignments/Writing Reports (Topic development/brainstorming, 119, 62.3%; Learning new concepts/knowledge, 65, 34.0%; Summarizing articles, 51, 26.7%; Refining expression/grammar/style, 44, 23.0%; Writing drafts, 38, 19.9%; Programming/coding, 36, 18.8%), followed by Study/Exam Preparation (Getting additional explanation, 67,

35.1%; Summarizing course content, 48, 25.1%; Creating potential exam questions/answers, 23, 12.0%) and Presentations/Projects (Presentation content development, 49, 25.7%; Project idea sharing/discussion, 42, 22.0%).

For Gen AI use purposes in everyday life/non-work contexts (all-that-apply), participants reported having used Gen AI for several areas, including Content Planning/Creation (Refining content/improving sentences/translation, 37, 19.4%; Getting ideas for content creation for YouTube/podcasts/blogs, 20, 10.5%), Travel/Event (Travel planning, 33, 17.3%), Entertainment/Hobbies (Recommendation for movies/shows/books/music, 29, 15.2%; Hobbies, 27, 14.1%), and Mental Health (Stress-relief/mental health improvement methods, 21, 11.0%). Few participants (less than 5%) had experience in using Gen AI for Finance/Legal/Government and Home/Household-related topics.

Perceived Benefits of Gen AI Use

On a 5-point Likert scale (Never - A Great Deal), participants rated their perceived benefits of using Gen AI, which were higher for Saved time for assignments/reports (M=3.5), Improved the quality of assignment/reports (M=3.3), Helpful for decision making process (M=3.2), and Improved overall time management (M=3.1). Perceived benefits were lower for Saved time for everyday life tasks (M=2.8) and Improved everyday life task outcomes (M=2.7).

Gen AI Learning Methods and Institutional Support

When asked about supports received from universities/libraries about Gen AI use (all-that-apply), only 33.5% (64 students) reported having received at least one type of support. 44 (23.0%) received support through Instruction sessions, 26 (13.6%) through Usage guides, and 8 (4.2%) through Workshops/Seminars. Regarding learning methods for Gen AI (all-that-apply), the most common method was Self-learning (153, 80.1%), followed by College classes (57, 29.8%), Friends and colleagues (45, 23.6%), and Online tutorials and YouTube (31, 16.2%). Other methods included Web resources/blogs (17, 8.9%), Other online classes (8, 4.2%), Social Q&A websites (5, 2.6%), Gen AI tools websites (5, 2.6%), and Books (4, 2.1%). Regarding the most helpful learning methods, more commonly used learning methods were not always more helpful learning methods. Among 153 students who used Self-learning, 98 (98/153, 64.1%) found it the most helpful learning method. The ratios (most helpful/used) for other learning methods were 19/57 (33.3%) for College classes, 14/45 (31.1%) for Friends and colleagues, 24/31 (77.4%) for Online tutorials and YouTube, 11/17 (64.7%) for Web resources and blogs, 3/8 (37.5%) for Other online classes, 1/5 (20.0%) for Gen AI tools websites, 2/5 (40.0%) for Social Q&A websites, and 3/4 (75.0%) for Books. (Figure 1)

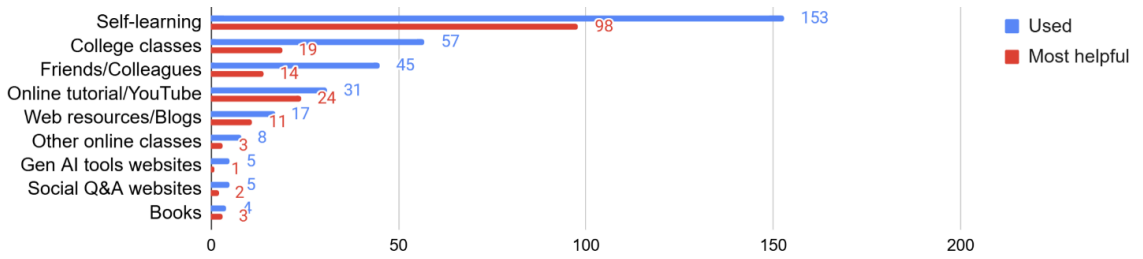

Figure 1. Used vs. Most Helpful Gen AI Learning Methods

Gen AI Use Experience

With open-ended questions, participants shared their positive and negative experiences in using Gen AI. Key themes in their positive experiences included getting help in developing ideas, gaining insights from new and diverse perspectives, and saving time for tasks. Participants' negative experiences centered around inaccurate information, difficulties in getting the intended outcomes or verifying the accuracy, and concerns around ethical use.

DISCUSSION AND CONCLUSION

Preliminary findings of this study show a widespread adoption and use of Gen AI tools among college students in South Korea. Although academic use was dominant, notable proportions of students also used Gen AI in everyday life/non-work contexts for Refining content (19.4%), Travel planning (17.3%), Recommendation for entertainment (15.2%), and Stress-relief/mental health improvement methods search (11.0%). Given the importance of overall well-being and the increasing mental health challenges among college students (Lattie et al., 2020; Oh et al., 2020), the current findings indicate the need for more studies on college students' Gen AI use in everyday life and well-being/mental health contexts. Also, only 33.5% of students received support from universities/libraries on how to use Gen AI, and many relied on self-learning. In this context, participants shared their challenges in using Gen AI, involving inaccurate information, concerns around ethical use, and difficulties in achieving intended outcomes. Our findings suggest that these challenges may be mitigated through enhanced institutional support on learning how to use Gen AI effectively and responsibly, particularly via university/library classes and online tutorials/web resources for more structured learning and supported self-learning. Such efforts would be instrumental in fostering more equitable access to and successful use of Gen AI for college students in both academic/work-related and everyday life/non-work contexts.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author: conceptualization, data curation, formal analysis, investigation, methodology, visualization, writing – original draft, and writing – review and editing; Second Author: conceptualization, investigation, methodology, project administration, resources, validation, writing – review and editing; Third Author: conceptualization, data curation, formal analysis, investigation, methodology, project administration, software, writing – review and editing.

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Effective Shared File Management in Cloud Storage for Collaborative Research: Lessons from Successful Cases

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ABSTRACT

Cloud storage is widely used by researchers for collaborative projects, offering clear benefits for data sharing and collaborative work. However, managing shared files in cloud storage can be challenging, especially when collaborators have different personal information management practices. By conducting a grand-tour interview and semi-structured interviews with 30 researchers across disciplines in the United States, this study explored different strategies researchers use for managing shared files and identified three successful cases. These cases revealed effective strategies, including developing a set of rules for managing files, creating a guide file, and providing a training session. In particular, the results showed that even small efforts can significantly enhance the organization and accessibility of research files. This study deepens our understanding of shared file management and provides practical strategies that can support more effective shared file management for collaborative research projects.

KEYWORDS

Personal information management; shared file management; information behavior; cloud storage; research files

INTRODUCTION

Researchers commonly use cloud storage platforms like Google Drive or Dropbox to collaborate on research projects (Chaudhry & Alajmi, 2024). These platforms offer significant benefits, such as the ability to access files from any device and collaborate on a file in real-time (Bergman et al., 2014, 2019; Capra et al., 2014; Tang et al., 2013). However, managing shared files, particularly those that are saved, organized, and used by individuals with different practices, can be challenging, often leading to cluttered storage (Bergman et al., 2019; Massey et al., 2014). While the difficulties of managing shared files have been discussed, and some have focused on specific activities like retrieval to address them, few studies have comprehensively explored strategies to overcome these challenges. One of them is Massey et al. (2014), who found that creating ContentMaps, which show the structure of the shared files, and organizing files based on task, expertise, and tool affordances were helpful strategies. However, Massey's study involved 27 non-academic participants and did not focus on shared research file management for collaborative research. A more recent study by Oh (2024) examined ways to improve researchers' satisfaction with shared research file management. Oh found that organizing files regularly and frequently, using organization of files when finding/re-finding shared files, establishing explicit rules for organizing shared files and folder structures, and archiving shared files led to greater satisfaction. However, this study used an online survey, which may not have captured the nuanced, real-world strategies researchers use or the broader context in which these strategies are applied. Although previous studies have discussed the challenges in managing shared files in cloud storage, and a few have explored potential ways to address them, a study that conducted in-depth interviews to examine the successful strategies researchers use in managing shared files for collaborative research has been missing. Thus, this study investigated the strategies employed by researchers, identified successful cases, and discussed their strategies.

METHODS

Data was collected by conducting grand-tour and semi-structured interviews with 30 researchers at higher education institutions in the United States who have ongoing collaborative research projects. Participants were recruited via a survey sent to mailing lists of 350 randomly selected doctoral universities (Carnegie Classification of Institutions, 2018). At the end of the survey, participants were invited to participate in the interviews. Among the 241 researchers who expressed interest, 30 were invited while balancing demographic variables. Each participant received a $50 gift card. The grand-tour interview began with participants giving a tour of their cloud storage, explaining how they manage shared files for collaborative projects. This was followed by a semi-structured interview exploring their practices, challenges, and strategies. The average length of each interview was about an hour, and all were recorded and transcribed. To analyze data, initial codes were developed and applied to the transcripts. After the initial round of coding, all interview transcripts were re-coded using the refined coding scheme. This iterative process allowed refined analysis and helped identify researchers with particularly effective shared file management practices.

FINDINGS

Participants

Among the 30 participants, 50.0% were female (*n*=15) and 50% were male (*n*=15). They were from arts & humanities (33.3%, *n*=10), sciences (33.3%, *n*=10), and social sciences (33.3%, *n*=10). In terms of age group, they were in their 20s (30.0%, *n*=9), 30s (26.7%, *n*=8), 40s (23.3%, *n*=7), 50s (13.3%, *n*=4), and 60+ (6.7%, *n*=2).

Among the participants, 46.7% were White (*n*=14), 26.7% were Asian (*n*=8), 16.7% were Latino/Hispanic (*n*=5), and 10.0% were Black/African American (*n*=3). In the case of roles, 50% (*n*=15) were principal investigators (PI)/Co-PIs, 30.0% were researchers (*n*=9), and 20.0% were research assistants (RA) (*n*=6).

Successful Cases

While most participants struggled with shared file management, a few were successful. This section highlights three successful cases and key strategies that made their shared file management effective for collaborative research.

Case 1: Principal Investigator in a Social Science Project Using Box With 13 Members

Participant 15 (P15) was a researcher in her 50s and the project PI in Social Sciences. Her team of 13 members used Box for their project. P15 explained that the first step she took was holding meetings with the team to establish shared file management rules, including folder structure, file naming, and version control. She noted that a couple of team members took the lead in creating the framework based on the team's discussions. Starting with a few broad, higher-level folders was effective, and the version control system, which uses decimal numbers for minor updates (e.g., 1.1, 1.2) and whole numbers for major updates (e.g., 2.1, 3.1), was "incredibly effective". P15's team also created a guide file outlining folders/subfolder structures and naming conventions to help new members. She said, "Everybody it's like they were hungry for it…They see how standardization and predictability in these documents can really help you find things quickly". She also emphasized the importance of providing a brief training session for new members on cloud storage (i.e., how it works) and file management rules.

Case 2: Principal Investigator in a Science Project Using Dropbox and Google Drive With Three Members

Participant 12 (P12) was a researcher in his 50s. He was the project PI in the Sciences. His research team included three members and used both Dropbox and Google Drive to manage shared files. He explained that, due to difficulty in finding files, his team held a meeting to establish an organizational system, starting with file naming conventions. For data files, they added dates in reverse order (i.e., year, month, date) and the initials of team members who collected the data, which greatly improved organizing and finding files. His team also created a guide file in each folder outlining the experiment, the folder contents, and the list of subfolders and files, which he said, "made a big difference" in finding and understanding files. P12 noted that his lab manager took the lead in setting up the folder structure based on team discussions and provided training to the new members. Additionally, P12 shared the benefit of restricting file access to relevant members, which helped protect data and prevent unnecessary storage and device overload.

Case 3: Research Assistant in an Arts and Humanities Project Using Box with Six Members

Participant 22 (P22) was a researcher in her 30s working as an R on the Arts and Humanities project with a team of six members. The team used Box for collaboration. P22 joined the ongoing project and received training sessions from the PI, who explained the project, expectations, key files, and how to find and organize files, which P22 described as "really, really helpful". Her project team also had precise instructions on the file naming convention developed by the PI. The participant said, "So far, there hasn't been any challenge for me… because filing the files and organizing them in the order in which I was expected to, was pretty easy and straightforward". P22 shared that the PI was readily available to answer questions, so she could easily cross-check with her regarding organizing or deleting shared files. P22 appreciated having clear rules, instructions, and an accessible point of contact.

DISCUSSION AND CONCLUSION

Despite differences in academic disciplines, team sizes, and cloud storage platforms, participants shared common practices that contributed to effective shared file management. These included having clear rules, such as folder structures, file naming conventions, and version control, which aligns with Oh's (2024) finding that having explicit rules for organizing and folder structures enhances researchers' satisfaction with shared file management. Discussing these rules with a team and designating someone to lead the process was also effective. Another helpful strategy was creating a guide file that may contain information about folder structures, naming conventions, file-related experiment details, and a list of files, an approach that partially overlaps with the ContentMaps in Massey et al.'s (2014) study. All three participants shared the value of training sessions that may introduce the project, cloud storage use, expectations, key files, and rules for file management. Additional successful practices included restricting folder access to relevant users and having a designated person to answer questions. Notably, participants emphasized that these efforts don't need to be extensive. For instance, P15 said, "It does not have to be in-depth at all", and P12 said, "It's nothing too massive", regarding the training and guide files. These findings reveal that small, intentional actions can significantly improve shared file management. This study contributes to the literature on personal information management and information behavior. In particular, it addresses the challenges of managing shared files in cloud storage, identifies successful practices, and suggests practical strategies that can directly support researchers in managing shared files for collaborative research.

GENERATIVE AI USE

I confirm that I did not use generative AI tools/services to author this submission.

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Exploring Data Sharing in Medical and Health Sciences through Mega Journals

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ABSTRACT
This work-in-progress study examines how researchers in medical and health sciences engage in data sharing, focusing on Data Availability Statements (DAS) from articles published in three mega journals indexed in PubMed Central. Preliminary results reveal a variety of DAS categories, each reflecting a distinct approach to sharing research data. The distribution of these types was broadly similar between articles with and without Korean-affiliated authors. This study could contribute to understanding how data sharing practices are evolving in medical and health research and highlights opportunities to better align global norms with national-level practices.

KEYWORDS
Data sharing; data availability statement; mega journal; medical and health sciences

INTRODUCTION
Data sharing plays a critical role in promoting transparency, reproducibility, and collaboration in medical and health sciences research. It enables researchers to verify results, conduct secondary analyses, and extend previous findings (Tenopir et al., 2011). In clinical contexts, access to shared data supports evidence-based decision-making for patient care, treatment guidelines, and public health policy (Hermansen, et al, 2022). To support such practices, many journals now require Data Availability Statements (DAS) in published articles, providing structured details on where and how data can be accessed (Federer et al., 2018). Mega journals—characterized by open-access policies, broad disciplinary scope, and a focus on technical soundness—have actively promoted the inclusion of DAS through strong open science policies and high publication volume (Spezi et al., 2017; Severin et al., 2020). In Korea, interest in data sharing is growing in response to global transparency efforts and funding requirements (Yoon & Kim Y., 2020), but little is known about how they align with global norms (Kim J. et al., 2020; Kim Y. et al., 2022). To address this gap, the current study examines data sharing trends by analyzing DAS in three representative mega journals indexed in PubMed Central (PMC). It compares DAS patterns of all articles with those authored by researchers affiliated with Korean institutes. Particular attention is paid to where the data are deposited, how access is granted, and what conditions, if any, are specified for reuse. This approach could offer a grounded understanding of data accessibility practices, within the broader international research landscape.

METHODS
This study reviewed data sharing practices in medical and health research through articles (2000–2024) in three PMC mega journals—*PLOS ONE*, *Scientific Reports*, and *BMJ Open*—selected for their volume and relevance. The data were retrieved using a custom web crawling script developed by the researchers. For each research article, metadata, and the full text of the Associated Data section, which include DAS, were collected. Coding categories were initially developed through a manual review of 2,000 randomly selected statements and informed by prior classifications (Federer et al., 2018; An & Byun, 2023), then applied to the full dataset using rule-based automated classification. Table 1 summarizes the categories, their definitions, and keyword-based automation strategies.

Category	Description	Automation strategies and example keywords
Upon Request	Data are not publicly shared but can be provided upon request	Detect co-occurrence of request-related expressions and conditional phrases, such as “provided upon reasonable request”, “available from the corresponding author”
Repository	Data is deposited in an external repository	Detect co-occurrence of known repository names and access indicators, such as DOI, URL, or accession ID, “accession number”, “http(s)://”
Public Data Use	External, public data were reused, and the source is cited.	Detect references to public/open data repositories and usage statements, such as “publicly available dataset”, “retrieved from public repository”
In Article/ Supplement	Data are provided within the article or as supplement.	Detect file inclusion phrases and simple inclusion statements, such as “included in the manuscript”, “provided as supplementary files”
Restricted	Explicitly stated data inaccessibility due to restrictions.	Identify phrases indicating data are not available or will not be disclosed, such as “restricted access”, “data will not be disclosed”, “access is not permitted”
Not shared	Data are not shared due to ethical, legal, or privacy restrictions.	Detect presence of restriction terms combined with explicit denial of sharing, such as “due to privacy concerns”, “restricted by IRB”, “due to confidentiality”
No dataset	No dataset was generated or analyzed in the study.	Identify phrases indicating absence of data generation or dataset association, such as “no associated dataset”, “no data associated with this article”

Table 1. Coding Categories for DAS and Rule-Based Classification

FINDINGS

A total of 177,396 articles were retrieved from PubMed Central (PMC): 78,486 from *PLOS ONE*, 88,858 from *Scientific Reports*, and 10,052 from *BMJ Open*. Among them, 9,461 articles (5.3%) had at least one author affiliated with a Korean institution—3,847 from *PLOS ONE*, 5,484 from *Scientific Reports*, and 130 from *BMJ Open*. Figure 1 illustrates the percentage distribution of DAS categories across the three journals based on the coding scheme described in Table 1. Articles classified as "etc." did not fit neatly into the predefined categories and will be examined further in a follow-up analysis. To maintain clarity, the figure reports category-level proportions, rather than detailed counts of articles per journal.

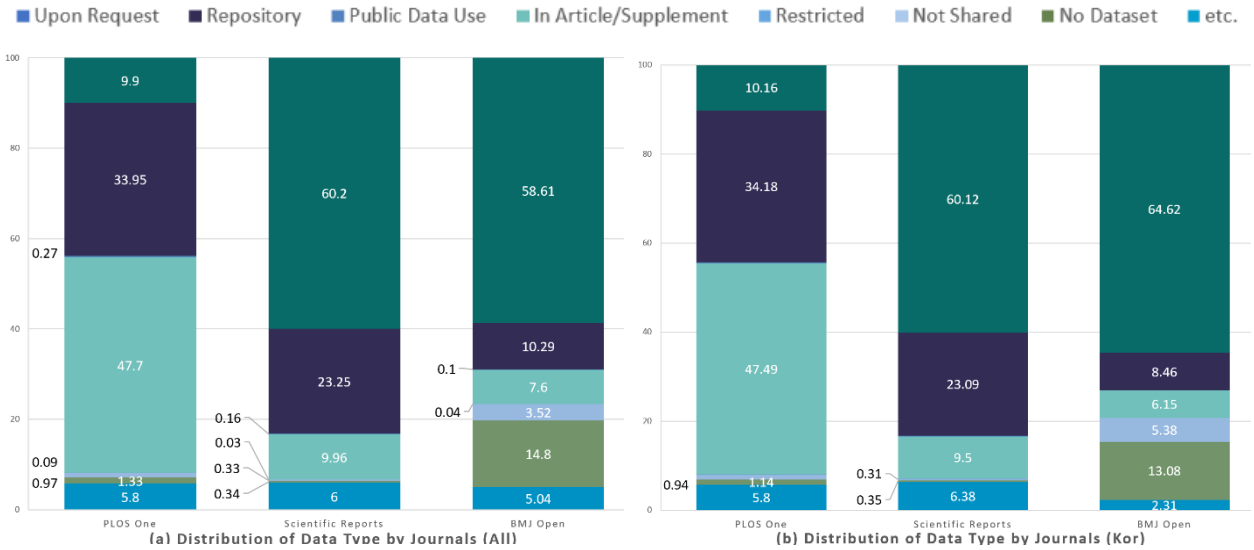

Figure 1. Distribution of the Coding Categories for DAS by Journals

Across the three journals in Figure 1(a), *PLOS ONE* had the highest proportion of "In Article/Supplement" (47.7%) and "Repository" use (33.95%). In contrast, Scientific Reports and BMJ Open showed a higher reliance on "Upon Request" access (58.6% and 60.3%, respectively). While *Scientific Reports* had the second highest rate of "Repository" (23.25%), *BMJ Open* reported a substantial proportion of articles as having "No Dataset" (14.8%). In Figure 1(b), which displays data from articles authored by researchers affiliated with Korean institutions, the distribution across DAS categories is similar to the overall pattern in Figure 1(a). The proportions by category are largely consistent within each journal, suggesting that journal policies may have a stronger influence on data sharing practices than national or institutional affiliation. Further analysis will be conducted to explore this possibility.

Additionally, we examined which repositories were used to share the datasets generated by researchers. Among the repository-linked articles, the most commonly identified repositories included GEO, SRA, ENA, GenBank, Zenodo, Dryad, Mendeley Data, and Figshare. Further investigation will be conducted to analyze repository usage by discipline, data type, and repository accessibility policies.

DISCUSSION AND CONCLUSION

These preliminary findings suggest that data sharing patterns in medical and health sciences are broadly similar between Korean-affiliated and non-Korean publications. This highlights the potential influence of journal-level policies over national-level differences in shaping data practices. Unlike prior studies that focused on single journals or national contexts (Federer, et al., 2018; Ahn & Byun, 2023), this study takes a comparative approach across multiple journals, observing data sharing by journal policies, global trends, and local practices.

Further analyses are underway focusing on: (1) journal-level comparisons to assess how editorial policies influence data sharing; (2) temporal trends to evaluate the impact of open science initiatives; and (3) mapping of data repositories and reused sources. Follow-up studies will also examine how researchers in medical fields actually manage and share data, beyond what is reported in DAS.

GENERATIVE AI USE

ChatGPT was used to assist with grammar correction. The authors are solely responsible for the content.

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Hearing Refugee Voices: Preliminary Findings on Trauma-Informed Refugee Services in Public Libraries

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ABSTRACT
Public libraries are important support for refugees, but how they respond to trauma and special needs remains underexplored. This study examined refugee services in U.S. public libraries and combined the perspectives of librarians and refugees. Data was collected through a national survey of 229 library staff, five focus groups with librarians, and five focus groups with refugees to discuss the potential of trauma-informed care (TIC) to improve library services for refugees. Results showed that many public libraries serve refugees, partner with social workers, community organizations, and governments, and have begun to consider refugees' trauma and integrate TIC by training staff and creating a welcoming environment. Future research will focus on detailed data analysis and customized TIC training.

KEYWORDS
Public libraries, Refugees, Trauma-informed care (TIC), Library services

BACKGROUND
By 2024, more than 120 million people were forcibly displaced worldwide, including 43.4 million refugees (UNHCR, 2025). Refugees, as a vulnerable group, fled their countries to escape conflict, violence, or persecution and have sought safety in another country (UNHCR, 2025). Consequently, they frequently experience trauma. Public libraries play critical roles in helping refugees (Dannenbaum, 2023; Leong, 2016; Lloyd, 2017) because libraries are considered safe and welcoming (Leong, 2016) and increasingly serve as community hubs access to resources (Sharkey et al., 2021). However, how public libraries support refugee communities, particularly those affected by trauma, remain underexplored. This project explored the refugee services in U.S. public libraries, from both librarian and refugee perspectives. The Research Questions include:1) What kinds of refugee services are available in public libraries across the country? 2) How accessible are these services to refugees? 3) What are the needs of refugees that can be met by public libraries? 4) What are the challenges of providing services targeting the needs of refugees? 5) How can libraries develop and deliver refugee programs and services that are both accessible, trauma-informed, and culturally responsive?

LITERATURE REVIEW
Trauma, Refugees, and Trauma-Informed Care
Trauma is a result of violence, abuse, neglect, loss, disaster, war and other emotionally harmful experiences (SAMHSA, 2014). Trauma-informed care (TIC) is a framework for creating safe, trustworthy, and empowering environments for people who have experienced trauma (SAMHSA, 2014) which can help address the specific needs of refugees as they recover from traumatic experiences (Isakov et al., 2024).While traumatic informed care (TIC) has been used in healthcare and social work, its use in public libraries is still in its early stages. Some public libraries integrate TIC by working with social workers (Finch & Real, 2023; Tolley, 2020).

Public Libraries as Support for Immigrants and Refugees
The term immigrant and refugee are not synonymous. Refugees normally are forcibly displaced and often encounter unique challenges (Lloyd et al., 2013; Strang & Ager, 2010). Some earlier studies may use the term "newcomers" or "new immigrants" (Quirke, 2014) in their research to discuss library service to immigrants and refugees (Cuban, 2007; Dannenbaum, 2023). Public libraries support for immigrants and refugees may differ overlap. Public libraries support immigrant communities by providing a variety of programs (Delgado, 2023; Karbach, 2016) and inclusive and friendly spaces (Audunson et al., 2016; Delgado, 2023). They also serve as community assets by hosting immigrant-led initiatives to promote connections across diverse populations (Delgado, 2023; Williment & Jones-Grant, 2012).

Public libraries play a valuable role in supporting refugee populations. Several case studies have demonstrated how public libraries can support refugee communities (Bausman, 2016; Kidder, 2016; Lin & Boamah, 2019; Jaber, 2023; Vårheim, 2014). Vårheim (2014) examined library projects in Norway that built social trust and capital by helping refugees participate in language and civic integration courses. Dannenbaum (2023) proposed empathetic and scalable interventions in public libraries to serve immigrant and refugee communities by applying IFLA's framework of libraries as shelters, warehouses, gateways, and bridges. IFLA released their new guidelines for supporting displaced persons, including refugees, migrants, immigrants, and asylum seekers (Gerasimidou, 2024).

Method

A mixed-methods approach, including a national survey and focus groups with both librarians and refugees was employed. Two hundred twenty-nine responses from public library staff across the United States were collected. Participants were selected with purposive sampling by posting a recruitment statement with a link to the survey at the American Library Association Forum, social media of public libraries, university's school of library and information service social media, and outreach to state library departments and associations. Five focus groups with 14 librarians provided insights into current practices and views on refugee services. Five focus groups were held with 23 refugees, who shared their experiences with public libraries and discussed their needs.

PRELIMINARY FINDINGS

According to the national survey results, more than half of public libraries who responded serve refugees. There are more services for immigrants, however, the proportion of services provided in city, suburban, town and rural are very similar. These refugees come from a variety of countries and regions, mainly from Ukraine and Afghanistan. Some respondents said that libraries do not ask readers about their immigration status or nationality, while others emphasized that library services and programs are open to everyone. *"We don't tailor services or programs towards any specific group, nor do we officially collect this type of demographics information about those who attend our programs or use our services."* (Librarian #1) and "*Programming is open to all regardless of immigration status."* (Librarian #2)

Many libraries have addressed language barriers by providing multilingual resources and services. Some library materials and catalogs are in the refugees' native languages. Online language learning courses, and community service guides are also provided in multiple languages. In addition, some libraries are equipped with multilingual staff or have access to translation support. "*We do have some people on staff who speak French so that helps. We use Google translate to begin conversations, and then we switch to a local translation over the phone service if the conversation is ambiguous or complex."* (Librarian #3)

Public libraries offer various programs and services for refugees, including safe spaces, IT support, language tutoring, English language and literacy classes, cultural events, immigration and naturalization assistance, government paperwork processing help, tax support, and job training. Libraries listen to the needs of refugees by directly interacting with the community, collaborating with various organizations, involving refugee community members in the decision-making process, and encouraging feedback and voices. "*Attempts to meet them where they are - come to community events and work with different organizations to introduce the library to them"* (Librarian #4)*;* "*We lead by example with kindness and patience and intervene when we see any patron not treating others with respect - our #1 behavior guideline is keeping the library welcoming to all."* (Librarian #5) *and "We ask them what they want to see, hear and read".* (Librarian #6)

Public libraries have recognized that refugee patrons could experience trauma, and some have introduced trauma-informed services to create safe, welcoming environments for refugees and guide them to other supports. They have strengthened their capabilities by raising staff awareness and providing professional training. "*Some of the library's immigrant patrons experience similar trauma such as sexual abuse, child abuse, homelessness, war, crime and violence. The library connects them with counseling services and their families with funeral services if accidental death happens."* (Librarian #7)

In the focus groups with refugees, some participants expressed interest in storytelling activities, homework help and child-friendly spaces. They also wanted to improve their computer skills and English. However, some were not aware that libraries could provide such support. Several refugees had little or no experience using public libraries in their home countries to compare to services available to them in U.S. public libraries.

CONCLUSION

This study shows that public libraries play an important role in supporting refugee communities through partnerships and trauma-informed care (TIC). Many libraries offer multilingual resources, inclusive programs, and safe environments to address refugees' needs, including language barriers, trauma, and digital literacy. Refugee participants expressed the need for support for children, English learning, and computer use. Some were unaware that libraries provide such services, suggesting a gap in communication and outreach. This study explored the role of trauma-informed care in library services and provided suggestions for improving refugee services. The study findings in this poster were limited by preliminary data analysis and the lack of comparison between librarians and refugees. In addition, the findings cannot be generalized to library services for refugees outside of the United States. Further data analysis and providing professional trauma-informed care training for library staff will be the main directions for future research. For future research implications, the authors need to explore the reasons for certain descriptive statistics such as more than half of participants have been providing services for refugees.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author: Writing, Data Collection and Analysis; Second Author: Revision, Survey and Focus Group Design and Data Collection; Third Author: Revision, Survey and Focus Group Design and Data Collection.

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Navigating Health Information Poverty: International Students' Challenges and Strategies

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ABSTRACT
This study used Chatman's information poverty theory and conducted semi-structured interviews with 11 participants to explore information poverty that international students face in obtaining health information. The study identified four themes aligned with the theory: deception, risk-taking, secrecy, and situational relevance. Chatman's six propositions suggest strategies to address these challenges. The results can inform universities and institutions in supporting international students' well-being.

KEYWORDS
Information poverty, information behavior, international students, health information behavior

BACKGROUND
International students face challenges in adapting to new environments (Hertzum & Hyldegard, 2019) and these challenges sometimes extend to seeking health information (Russell et al., 2008). Chatman (1996) explained that information poverty was contributed by people's membership within a particular social group. Marcella (2018) defined information poverty as denied access to the information necessary for survival, self-sufficiency, sustainability or development. Information poverty in the health context refers to people's inability to effectively obtain, understand, evaluate or apply health information. As Dervin (1994) noted, everyone is information poor, information poverty can exist in international students' health information seeking.

Chatman (1996) explored the experiences of low-income groups and developed Information Poverty Theory. Information Poverty Theory introduces four key concepts, deception, risk-taking, secrecy, and situational relevance, and formulates six propositions (Chatman, 1996; Gibson & Martin, 2019). Few studies have examined international students' health information behaviors using Chatman's information poverty theory and exploring international students' health information poverty is significant because those information poverty harm their well-being. This study aims to explore international students' health information poverty and research questions are:

- What health information poverty does international students experience in their health information behavior?
- How do international students' health information behaviors reflect Information Poverty Theory?
- How can Information Poverty Theory inform strategies to address health information poverty?

LITERATURE REVIEW
People need health information for a variety of reasons, including learning about healthy lifestyles (Anker et al., 2011), managing specific health problems (Duhon & Jameson, 2013). For international students, access to health information is essential for making informed medical decisions and adapting to a new environment, and their health information needs cover all aspects, including insurance policies, vaccinations, and other health-related matters (Russell et al., 2008). However, many factors, such as language, culture, and unfamiliar local healthcare systems, hinder their access to necessary health information (Pan & Rubenstein, 2024).

Chatman's information poverty theory is applied to different populations, particularly among marginalized groups. Gibson and Martin (2019) examined information access among mothers of children with Down syndrome and autism and verified factors like perceived gaps in knowledge, class distinctions, risk assessment, and secrecy which align with Chatman's key propositions. Terrile (2023) examined community college students and found their information behaviors reflect a "small world" dynamic which rely on interpersonal interactions and online resources.

METHOD
This study employed convenience sampling, and then semi-structured interviews were conducted either in person or via Zoom. A total of eleven international students participated in this study, including three undergraduate and eight graduate students. They came from five regions: East Asia (4), the Middle East (3), South Asia (2), Europe (1), and Africa (1). None of the participants were native English speakers. Interviews were recorded and transcribed for analysis. Information Poverty Theory guided the whole coding process. Four core concepts, deception, risk-taking, confidentiality, and situational relevance, served as pre-determined themes to identify patterns within participants' narratives and deductive coding approach aims to uncover insights into the specific challenges and experiences of international students.

FINDINGS

Students' health information behaviors are influenced by various challenges, including linguistic barriers, cultural stigma, unfamiliar healthcare systems, and financial constraints and four key themes emerged in those interviews.

Deception: cultural and language barriers can hinder effective communication so they may use some unreliable information from social media and internet and cheated by some individuals.
Participant S: I use the Internet to get health information, but there is a lot of false information on it.
Participant B: When you find the wrong information on the Internet, and then you consume that information which is wrong, meaning that you will do wrong thing for your health.

Risk-Taking: Despite the possibility of finding false information, some international students still rely on the internet, because of its affordability and ease of use.
Participant A: So, while it's good to easily access that information, it can be bad for people like me who are not medical doctors. There are so many fake things that look good.

Secrecy: Students often adopt self-protective habits and keep their troubles private because cultural stigma prevents open discussions about mental health and sexual health. This secrecy may also be influenced by worries about excessive medical expenses, which may make individuals reluctant to seek expert assistance.
Participant B: For example, for health information related to my body, I would first ask my close friends.

Situational Relevance: The situational relevance of information refers to how the selection and use of information depend on the specific needs of the situation. They depended on hospitals and family members for health information prior to studying overseas. However, their behavior became more situational once they arrived in a new country since they were unfamiliar with the local healthcare system.
Participant B: (Before) So, my father is a doctor, so I always actually, asked my father.
(After) What I was having, and then my friends would ask their friends, you know, like it was like a network.

DISCUSSION

Six propositions of information Poverty Theory offer insights into developing strategies to address the health information poverty faced by international students:

Social Networks Inaccessibility: International students rely heavily on friends and family, but the distance from home and limited social networks make it difficult to get health information and this matches Chatman's first proposition. Student organizations and peer support activities will help students expand social networks.

Social Barriers: Social barriers play a significant role in the information poverty faced by international students when seeking health information. As newcomers to a foreign country, they often find themselves excluded from local society because of language barriers, unfamiliarity with the healthcare system, and cultural differences. University resources, such as counseling services and workshops, can help international students address challenges.

Self-Protective Behaviors and Social Norms: According to Chatman's third proposition, social norms may cause students to avoid health information. Some students come from cultures where discussing certain health conditions is stigmatized or viewed as shameful. As a result, they may put off seeking medical attention or keep their health issues to themselves. Health literacy workshops focused on combating stigma can help students feel more comfortable seeking information and care and encourage them to act when needed.

Secrecy, Deception, and Mistrust: International students often choose secrecy and deception, especially when they fear that sharing health issues may lead to negative consequences. Many students may conceal health issues because they do not trust others to provide useful advice or support. Increasing access to reliable, trustworthy sources of health information can encourage them to be more proactive in seeking health information.

Avoidance of Negative Consequences: As stated in Chatman's fifth proposition, fear of negative consequences affects students' health information behavior. They worry that the process of obtaining health information may lead to embarrassment and misunderstanding due to language problems and cultural differences. Providing culturally sensitive healthcare services can help reduce these fears.

Introduction of New Knowledge: As stated in Chatman's sixth proposition, introducing new knowledge can help international students adapt to new environments. Resources such as multilingual websites and translation tools can enhance students' access to health information.

CONCLUSION

This study verifies international students' health information poverty exists and discusses the potential strategies for coping with that information poverty. International students' well-being is significant and draws concerns from students, students' families, and universities and the findings benefit universities, libraries, and institutions by providing references for offering multilingual support, organizing health literacy workshops, and establishing peer support networks. However, the study is based on a small, convenience sample. To address these limitations, future

research should involve more diverse samples and incorporate additional methods, such as focus groups, to triangulate the data and enhance the reliability of the findings.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author: data collection and analysis, writing

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Library Workers' Perspectives on Participatory Community Engagement with Immigrants: An Exploratory Sequential Mixed-Methods Study

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ABSTRACT
Libraries have been serving immigrants since the early 20th century in the United States. Despite this long history, library services to immigrants have not evolved much beyond the traditional set of language-learning programs, often criticized due to the perceived low relevance of the resources and lack of accessibility. To address such a disconnect between intended users and provided services, libraries have adopted participatory methodologies, especially when working with historically marginalized communities. Zooming in on the precise intersection of U.S.-based library workers' experiences of employing participatory practices in their work with local immigrant communities, this mixed-methods study aims to create an overview of a library-immigrant community participatory network that shows how distinct stakeholders are related and influence the process as well as the outcome of effective community engagement efforts from the library workers' perspectives.

KEYWORDS
Librarians, Immigrants, Participatory methodologies, Community engagement, Library technologies

INTRODUCTION
Serving immigrants has been an essential part of library services in the United States since the early 20th century (Ndumu & Park, 2025). However, recent critical LIS scholarship has pulled the institutional role of libraries in perpetuating historical systemic inequities to the forefront, shedding light on the need for transformative, justice-centered library services (Grauel, 2022; Velez & Villa-Nicholas, 2017; Wiegand & Wiegand, 2018). The critical investigations also revealed that the repertoire of immigrant services in libraries had not evolved beyond traditional language-learning programs (Lim, 2009). These programs have been criticized due to their perceived low relevance and lack of accessibility (Grossman, 2022; Kim et al., 2023). To address such a disconnect between intended users and provided services, and the ideals of inclusion and the institutional history of exclusion, there has been a growing interest among both library scholars and practitioners in incorporating participatory methodologies into library services, especially when working with historically marginalized communities (Barbakoff, 2023; Braun, 2024; Turner & Gorichanaz, 2018; Wihelms, 2022; Young & Brownotter, 2018). In this context, participatory design (PD) methodology emerges as a well-suited approach for engaging immigrant populations in library services as it centers on mutual learning, empowerment, and trust (Bødker, 2022). Despite the growing consensus on the importance of participatory practices that center community members as co-designers in library projects (Dogunke, 2020; Hider et al., 2024; Miettinen, 2018), little research has been done to investigate the conditions required for the successful implementation of such partnerships from the perspectives of library workers who are expected to and/or are interested in using participatory practices when working with immigrant communities. This lack of research makes it difficult to identify factors for success in participatory practices in libraries.

RESEARCH QUESTIONS
This study aims to create an overview of a library-immigrant community participatory network that shows how distinct stakeholders and factors – library workers, hosting libraries, community members, library policies, and library technologies – are related and influence the overall collaboration process as well as the outcome of such participatory community engagement efforts. This study, therefore, leads with the following core questions:

RQ1: What are the conditions under which U.S. library workers can successfully engage in participatory practices with their local immigrant communities?
RQ2: Who are the key stakeholders involved in the library-immigrant community participatory network, and how do they interact with one another?
RQ3: How do interactions among the identified stakeholders influence each other, and what is the impact of each interaction on the implementation of participatory practices in the library-immigrant community participatory network?

METHODOLOGY
Research Design and Rationale
This study takes a constructivist approach, aiming to articulate library workers' subjective realities of community engagement with immigrants (Guba & Lincoln, 1994). An exploratory sequential mixed methods approach (QUAL -> quan) was chosen to ground the inquiry in empirical data based on the target practitioners' lived experiences and

to identify relevant constructs within the particular contexts and relations in order to test further transferability of findings (Creswell & Plano Clark, 2018).

Data Collection

The study timeline is as follows: IRB approval is currently underway. Recruitment and interviews will begin in August 2025, followed by survey distribution in September. Data analysis will be conducted in October, with preliminary findings ready to be shared in November for the poster presentation. Participants will be recruited from existing librarian-immigrant community outreach networks. They will be directly invited for participation from geographical areas where immigrant populations are significantly concentrated, e.g., California, New Jersey, New York, Florida, etc. (Azari et al., 2024).

Semi-structured Interview

To identify key stakeholders as well as existing relationships and processes, semi-structured interviews consisting of 12 questions mapped to the three research questions outlined above will be conducted with purposefully selected participants. Interviews will focus on participants' current library-immigrant community participatory practices and the organizational and community contexts of their work.

Survey

Based on the findings from the semi-structured interviews, a survey questionnaire will be created based on the constructs identified from the semi-structured interviews and the themes identified from the literature review. Survey findings will be used to validate the identified influencing factors and measure the importance of each factor and the interactions between these factors. The survey will include information about demographics, professional experience, service location, the sizes of the immigrant communities served, staffing and hosting libraries, and the number of immigrant-centered programs offered. It will also ask respondents to measure the perceived importance and influence of each factor identified.

Integration Plan

The interview questions have been created based on the literature review, especially informed by Botero et al.'s (2020) conceptualizations of mundane and strategic in design work. The findings from the qualitative portion – specific stakeholders, their roles, processes, and the library technologies used – will inform the creation of a quantitative survey that will assess the effectiveness and influences of the identified factors using descriptive and inferential statistical analysis. The findings from the survey will further enrich our understanding of the identified factors and their relationships in the context of a library-community network and inform the creation of a conceptual map of a library-immigrant participatory network.

Limitations

As this study is currently in progress, preliminary findings are to be presented at the conference. While the outcome of the study may provide a conceptual model representing influential stakeholders and additional factors, it may not capture all the varying factors that exist among individual library systems and communities. Given the current overt anti-immigrant, anti-DEI political climate, some libraries may have already changed specific language in their job titles, descriptions, or programs to avoid being identified based on those values-specific keywords banned by the current U.S. administration (Connelly, 2025). In this context, recruiting participants may prove to be challenging. Future research involving immigrant community organizers and community members is also recommended.

CONCLUSION

This study actively seeks to incorporate library workers' lived experiences and field expertise into the creation of a conceptual map of a library-immigrant community participatory network. This approach could lend legitimacy to the study's findings and increase the likelihood of the findings being adopted into practice. The study findings will also contribute to bridging several knowledge gaps in the current PD literature in Library and Information Science (LIS), which include: the organizational, technological, and (inter) personal factors influencing library immigrant community engagement; the incorporation of library practitioners' perspectives; and the connections between research and practice. The study findings will be useful in assessing and improving current library institutional infrastructures and relationships involved in participatory community engagement efforts. Lastly, they will contribute to the growing scholarship at the intersection of libraries and participatory work as a methodological and epistemological approach to community engagement and empowerment, making a novel and important contribution to the growing area of critical LIS literature focusing on immigrant-centered library services.

GENERATIVE AI USE

The team confirms that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author – Conceptualization, Methodology, Writing – original draft, Writing – review & editing

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Stereotypes, Storytelling, and the (Un)Reliability of Generative AI

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ABSTRACT

This work investigated how different implicit demographics and dialects influence GenAI responses. We crafted eight different prompts—all language or dialect 'translations' of "Tell me a story about a queen who kills her husband and marries his brother"—and analyzed ChatGPT responses to each prompt. Our initial analysis indicates that: the responses are distinctly European in style and tone, the Southern USA dialect prompt is poorly interpreted by ChatGPT, and prompts written in other languages or by English Language Learners result in simpler stories.

KEYWORDS

ChatGPT, storytelling, implicit demographics, stereotypes, linguistic mirroring

INTRODUCTION

Humans often implicitly or explicitly use a variety of multimodal behaviors to adjust communication to other humans. For example, humans use physical gestures to add unique content to spoken language (Williams-Pierce et al., 2017), and people often echo and build upon one another's gestures (gestural mirroring) (Flood, 2018). Text-based Generative AI (GenAI), on the other hand, does not accept or produce such communication modalities, relying solely on text input and output. Consequently, such GenAI operates in what we call a *modality deficit*—that is, GenAI input and output modalities are a severely limited subset of the many modalities present in human-human synchronous communication. To account for this deficit, some GenAI systems are designed to adjust communication to particular individuals in a variety of ways (Prabhakaran, Qadri, & Hutchinson, 2022), such as using previous interactions in a personal account to customize future responses. The accumulation of conversational data over time can allow GenAI to form a model of the user's input patterns and preferences. This model can be useful, disastrous (Klee, 2025), or just plain creepy. As one author recently overheard in a store in the United States: "ChatGPT just said, 'Hey, girl, that ain't got no soul!' I think it knows I'm Black." The speaker's friend told her to delete that account and start a new one, which we interpreted as a dislike of such *simplified caricatures* (Prabhakaran, Qadri, & Hutchinson, 2022). In other words, the training/model seems to have led to a response style that uses a digital parallel to the type of vocal and gestural mirroring that human-to-human communication often contains, but was inherently stereotyped. While ChatGPT may not 'see' the color of a user's skin, or 'hear' their dialect or accent, it is using other indicators to develop models of individual users that include categories ripe for stereotyping. In order to investigate such potential stereotyping further, we asked: *Whether and to what extent are GenAI's responses shaped by implicit demographic or dialect cues embedded in user prompts?*

METHODS

We chose ChatGPT 3.5 as a freely available GenAI tool, specifically designed for easy use by anyone online, therefore quite popular. The six co-authors simultaneously and sequentially entered eight prompts, using fresh *incognito* mode for each prompt, and were not logged in to ChatGPT (GPT-4o mini, May 12 2025 version). This controlled for variation from model updates and eliminated the carryover effect shaped by earlier prompts.

Prompt Design

Each prompt was a 'translation' of the Initial Prompt: *Tell me a story about a queen who kills her husband and marries his brother.* Given the vast and only partially understood world of GenAI, we used a variety of edge cases that varied in frequency of use in spoken and/or written language. For example, we included a Southern USA dialect commonly spoken in a small geographic area (rural Mississippi and southern Louisiana), but infrequently represented in text; Shakespearean (established written work in the public domain, with frequent spoken usage in theater worlds); and Pirate (popularly written and spoken regularly in some communities on *Talk Like a Pirate Day*). We additionally included two prompts in languages other than English (Korean and Cuban-Spanish), as well as prompts phrased as by a Korean or Cuban-Spanish speaker learning English. Each translation prompt was created by someone with expertise in the subject (i.e., a museum curator) or by a native speaker of the language or dialect.

Analysis

As part of an ongoing project, this is a preliminary analysis using a two-phase methodology that uses individual

memoing followed by collective agreement to capture emergent themes (Birks, Chapman, & Francis, 2008; Shokeen et al., 2021; Simpson et al, 2024), particularly well-suited to investigating novel intellectual territory. Phase 1 was intentionally approached without *a priori* codes, in order to maintain intellectual openness to whatever results we found (Charmaz, 2006). We discussed emergent themes both across and within response types, identifying various rich areas for the next round of analysis, and report those findings here. Phase 2 will involve using the constant comparative method (Strauss & Corbin, 1998), to more rigorously identify emergent codes across the responses. We found three themes that emerged in response to one or more prompts: 1) Incorrect Response–the Southern prompt; 2) English Language Assumptions–Korean and Spanish prompts; and 3) European Obsession–all prompts.

FINDINGS

Incorrect Responses

We expected to receive prose-based narratives with fictional characters, and all responses *except* to the Southern prompt fulfilled this expectation. The responses to Southern consistently produced an output that differed in genre, structure, and interaction style, and involved real-life historical figures—e.g., Catherine the Great, Catherine Howard, and Anne Boleyn—structured in a bullet-pointed report-like manner, outlining historical facts. Those historical facts, however, failed to respond correctly to the prompt—none of the aforementioned queens actually killed their husband and married a brother. ChatGPT also questioned the prompter in a way not seen with other prompts, such through using phrases like "You might mean Anne Boleyn" or "Do you remember any more details about the queen you're talking about?" ChatGPT's response difference likely reflects the system's assumption of the standardized and dominant use of English, which incorrectly processed the prompter's intention, resulting in not just incorrect and biased responses but also erasing the cultural and linguistic nuances embedded in the Southern dialect.

English Language Assumptions

We observed that ChatGPT simplifies English when responding to prompts written in non-English languages (i.e., Korean and Spanish). Compared to responses initiated by English prompts (i.e., Straightforward, Southern, Shakespearean, Pirate), stories prompted in non-English languages have shown distinct characteristics: shorter length (mean word count: Korean 196 vs. Initial Prompt 433), lack of dialogue between characters (i.e., fewer direct quotes), and a lack of metaphorical descriptions. While responses generated from translated non-English prompts (i.e., prompts translated into English before input) included conversations between characters, these responses also featured distinctive formatting to streamline the narrative and highlight key elements—for instance, the cause of the king's death "The cause: poison—subtle, slow, and untraceable" (translated from Spanish to English). Depending on whether translation is involved or needed in the prompt language, ChatGPT appears to infer different levels of English fluency from the person who prompts it. We hypothesize that ChatGPT caters its language style to non-English speakers, often perceived as requiring additional scaffolding to enhance English readability.

European Obsession

First, characters' names were reminiscent of Anglo-Saxon and Latinate languages, such as with Prince Corwin, Queen Maerith, Elandra, and King Aldric. Mentions of castles, garments, vales, and wine reinforced the implied European setting even in response to Korean and Cuban-Spanish prompts. ChatGPT often mirrored our prompt's dialect at the superficial linguistic level (e.g., referencing music only in Pirate responses), but produced consistently European-style fairytale stories with settings, objects, and morose endings regardless of prompt. Additionally, the majority of responses used flowery language filled with similes and metaphors, with a third-person style of storytelling, and the husband was always killed with a poisoned drink. Given the British history of two of the prompts (Pirate, Shakespearean), this may be appropriate mirroring in those cases—although both now have a global presence that could easily have been reflected in more diverse responses. Even the Southern prompt, which varied considerably in tone and style compared to the other responses, still focused primarily on European royalty.

CONCLUSION & IMPLICATIONS

As Ofosu-Asare (2024) noted, AI could contribute "to the homogenisation of languages … a form of cultural colonisation" (p. 3052). Our preliminary findings indicate that there may also be a homogenization of *story*—women only kill their husbands with poisoned drinks, flowery metaphor-ridden language is an earmark of the genre, and so on. Our team will pursue future work to investigate commonalities across GenAI responses in greater depth. This includes analyzing variations in text complexity and length across different prompts, distinguishing between superficial and deeper forms of linguistic mirroring (e.g., whether generated plots and styles follow predominantly European narrative structures), and examining the portrayal of gender roles and representations. By using sociolinguistically informed prompts, our study offers novel insight into how GenAI models encode and respond to implicit demographic and dialectal cues, with complex implications for linguistically diverse users. Namely, these responses reveal systemic patterns of cultural stereotyping and linguistic bias in the technology—patterns embedded in the models themselves and also shaped by users' interpretations and interactions.

GENERATIVE AI USE

We confirm that we did not use GenAI tools/services to author this submission or analyze data.

AUTHOR ATTRIBUTION

First Author – Conceptualization, Data Curation, Investigation, Resources, Writing – original draft, Writing - review & editing. Second Author – Conceptualization, Data Curation, Investigation, Resources, Writing – original draft, Writing - review & editing. Third Author – Conceptualization, Data Curation, Investigation, Resources, Writing – original draft, Writing - review & editing. Fourth Author – Conceptualization, Data Curation, Investigation, Resources, Writing – original draft, Writing - review & editing. Fifth Author – Conceptualization, Data Curation, Investigation, Resources, Writing – original draft, Writing - review & editing. Sixth Author – Conceptualization, Data Curation, Investigation, Resources, Supervision, Writing – original draft, Writing - review & editing.

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Characteristics of Dataset and Model Reuse Patterns on the Hugging Face Platform

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ABSTRACT

This study empirically explores how Natural Language Processing (NLP) and Computer Vision (CV) datasets and models are reused in the Hugging Face community. We find that NLP tasks - such as Zero-shot-classification, Sentence-similarity, and Feature-extraction - require more diverse datasets compared to CV tasks on average. On the other hand, NLP datasets were reused less frequently than CV datasets. In addition, CV models were reused frequently to develop other models compared to NLP models. In conclusion, NLP models reused diverse datasets for training, while CV datasets and models were reused more and layered up together to develop other models. This study contributes to the understudied area of dataset and model reuse in computing and the broader data reuse subfield under Information Science.

KEYWORDS

Data reuse, Data sharing, Data lifecycle, Artificial intelligence

INTRODUCTION

Artificial Intelligence (AI) has surprised people by answering questions with human-like language and knowledge (e.g., ChatGPT) and by generating artistic visuals in domains traditionally perceived to be a field of human creativity (e.g., DALL-E 3 (Huang & Goh, 2024)). These advancements in AI technologies are in part attributed to the model and data sharing practices. Researchers in Machine Learning (ML) competed for the higher ground using benchmark datasets (Park & Jeoung, 2022) to demonstrate that their models. Models and datasets created through competitions are made public to prove their technical competencies (Zhou et al., 2018) and eventually contributed to the subsequent emerging fields that entail applied research using social media data (Park et al., 2024) and historical data (Park & Cordell, 2023a; Park & Cordell 2025; Griebel et al., 2024). However, while existing literature has focused on data sharing and reuse practices in academia, the reuse of datasets and models, particularly in the field of ML, remains relatively understudied. As a prevailing practice of reusing datasets and models in the ML community could reinforce existing bias and stereotypes (Park & Li, 2025; Park & Cordell, 2023b) already reflected in training datasets, the study on data sharing characteristics calls attention from information scientists to develop a better version of the data lifecycle for ML beyond archival metadata (Dobreski et al., 2020). Further, current scholarship on data reuse explored the role of trust (Yoon, 2014; Yoon & Lee, 2019) in data reuse, especially in collaborative work (Al-Ani & Redmiles, 2009), perceived benefit (Joo et al., 2017) as well as community and career benefits (Yoon & Kim, 2020), but it is not clear how those findings are relevant to ML dataset reuse. To address this gap, further research is needed on how ML datasets are reused, in what contexts, with what perceived benefits, and their key characteristics. As a starting point, this study presents early work on descriptive characteristics of datasets and model sharing practices in Hugging Face. Hugging Face is particularly well-known among developer communities for its support of Transformer architectures, which are integrated into its pipelines (Wolf et al., 2020) with easy plug-and-play Python programming language. Gaining popularity in the developer community led to exponential growth of datasets (Yang et al., 2024) along with the tendency to reduce the cost of developing the models from scratch (Jiang, 2022). In parallel with the idea of Communities of Practice (CoP); how group of people share collective identity through consensual knowledge (Van House et al., 1998), Hugging Face as a developer community provides an opportunity to empirically study data reuse practices in the computing field at scale. Specifically, we ask the following research questions: RQ 1: What is the degree of diversity of datasets in training NLP models and CV models? RQ 2: What is the degree of concentration of NLP datasets and CV datasets? RQ 3: What is the degree of concentration of NLP models and CV models?

METHODOLOGY

Data collection

The datasets and models on NLP and CV tasks published on Hugging Face were collected on February 15th, 2025 through the Hugging Face API. A total of 28,434 NLP datasets and 397,595 NLP models from 12 NLP tasks (Question-answering, Text-generation, Feature-extraction, Table-question-answering, Sentence-similarity, Translation, Summarization, Zero-shot-classification, Text-classification, Token-classification, Text2text-generation, and Fill-mask) were collected, and 9,845 CV datasets and 79,596 CV models from 18 CV tasks (Mask-generation, Text-to-video, Image-to-video, Zero-shot-image-classification, Unconditional-image-generation, Image-to-text, Image-to-image, Image-classification, Text-to-image, Image-feature-extraction, Text-to-3D, Depth-

estimation, Zero-shot-object-detection, Keypoint-detection, Object-detection, Video-classification, Image-segmentation, and Image-to-3D) were collected.

Datasets and models reuse

Users of Hugging Face are required to provide self-reported metadata and a plain-text description to support the management of models and datasets on the platform. Metadata records the base model if the model is a fine-tune, an adapter, or a quantized version (https://huggingface.co/docs/hub/model-cards), and this feature allows structuring hierarchy with parent (base) models and child (derivative) models. API provides access to information about the base model and can be further structured to examine which dataset was reused the most or which model was reused the most to develop derivative models in NLP and CV tasks. In answering RQ 1, we counted the number of datasets reused to train the models in NLP and CV tasks. For RQ 2 and RQ 3, we counted the number of times that the model and the dataset were reused as a base dataset and model, respectively. In our commitment toward supporting open, reproducible, and transparent data science, we share the code used in the study at https://github.com/park-jay/huggingface-models.

FINDINGS

In answering RQ 1, we focused on examining the diversity of datasets used to train NLP models and CV models. While NLP models for most tasks were trained on a little more than one dataset on average, the Zero-shot-classification task required the largest number of training datasets (μ=8.7574, σ=42.6210), followed by Sentence-similarity (μ=3.3647, σ=5.3457), Feature-extraction (μ=2.5782, σ=4.3964), and Text-generation (μ=2.3714, σ=4.27736). This finding indicates that the Zero-shot classification, Sentence similarity, Feature extraction, and Text generation synthesized diverse datasets to develop the model, compared to other tasks. Contrary to the observation of diverse dataset reuse in the Zero-shot-classification, Sentence-similarity, Feature-extraction, and Text-generation in NLP tasks, all CV models were trained on fewer than two datasets on average. The largest number of training datasets used for the model is Image-feature-extraction (μ=1.7600, σ=1.9579), followed by Depth-estimation (μ=1.7500, σ=2.3011), Video-classification (μ=1.6666, σ=0.9759), and Image-to-text (μ=1.6422, σ=2.9112).

To address RQ 2, the number of reuses of NLP and CV datasets was counted. Overall, many NLP task datasets remained less than one time, indicating that even though the dataset is available through the Hugging Face platform, it has not been widely used by the ML community. Table-question-answering (μ=0.0274, σ=0.2516), Translation (μ=0.1171, σ=0.6341), and Zero-shot-classification (μ=0.1244, σ=0.7998) remained the least three tasks reusing NLP datasets. The NLP datasets that had more than one reuse on average are found in Text-generation (μ=1.8877, σ=18.1683) and Sentence-similarity (μ=1.8331, σ=11.0991) tasks. Text-generation and Sentence-similarity datasets had high standard deviation as well, which may indicate that the dataset reuse may reflect a wide gap between the popularity of datasets. The popular datasets get an opportunity to be reused, while unpopular datasets do not have an opportunity to be reused (Zipf, 1949). Contrary to NLP, where we observed less frequent dataset reuse in NLP tasks, all CV tasks had more than one reuse on average. The highest CV task that had the dataset reuse is Image-feature-extraction (μ=1.7600, σ=1.9579), followed by Depth-estimation (μ=1.7500, σ=2.3011) and Video-classification (μ=1.6666, σ=0.9759).

For RQ 3, we examined how frequently existing models are reused in both the NLP and CV domains. While the majority of NLP models were reused between one time or two times on average, similar to the NLP task that reused datasets the most, the Text-generation models reused other models the most (μ=1.3347, σ=1.5012) on average. The Summarization model (μ=1.1769, σ=1.9735) and Zero-shot-classification model (μ=1.1417, σ=0.7373) followed the Text-generation models. High model reuse in the Text-generation task may indicate that the ML community is concentrating on creating GPT-like language models and shows dependency on existing models. In the CV domain, model reuse appears more frequent. Among CV tasks, Unconditional-image-generation models (μ=3.2500, σ=4.5000) re(used) other models on average, followed by Image-to-3d (μ=2.0000, σ=3.0000), and Image-to-video models (μ=1.3636, σ=0.9021). Overall, the differences in datasets reuse (RQ 2) and model reuse (RQ 3) patterns may suggest varied ML community norms and practices.

CONCLUSION

In conclusion, this study explores distinct patterns in the reuse of datasets and models across NLP and CV tasks in Hugging Face. NLP tasks, such as Zero-shot classification, Sentence-similarity, Feature-extraction, and Text-generation, used diverse datasets to train models, while CV models relied on less diverse datasets to train models (RQ 1). NLP Datasets in Text-generation and Sentence-similarity were reused the most, indicating high reliance on existing datasets, while CV datasets were comparably less reused (RQ2). For RQ 3, we found CV models reuse more compared to NLP models. While we do not yet have any explanation for the findings at this point, building on factors identified from previous studies, such as the concept of trust, documentation, and community validation (Yoon & Lee, 2019), our next goal is to explore the developers' motivation behind the differences between NLP and CV data reuse.

GENERATIVE AI USE

We used Copilot, available through Visual Studio Code, to write code for data collection and analysis.

AUTHOR ATTRIBUTION

Jaihyun Park: Conceptualization (lead), Formal Analysis (lead), Methodology, Writing (Original Draft Preparation).
Ayoung Yoon: Conceptualization (supporting), Investigation, Validation, Writing (Original Draft Preparation).

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Assessing the Relationship Between Citizens' Perceptions of AI Adoption in Healthcare: A Cultural Cognitive Perspective

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ABSTRACT
This preliminary study explores citizens' perceptions regarding the adoption of artificial intelligence (AI) in healthcare, grounded in Cultural Cognitive Theory. A total of 10,523 responses from the Pew Research Center's American Trends Panel Survey Wave 119 were analyzed using Pearson's Chi-square test of independence. The findings indicate that citizens' views, specifically their optimism or skepticism toward AI technology and their ideological stance, are significantly associated with their perceptions of AI use in healthcare.

KEYWORDS
Artificial Intelligence, Technology Acceptance, Information Technology, Health Informatics.

INTRODUCTION
This preliminary study presents the initial findings from the authors' project, which aims to understand how health information users productively utilize artificial intelligence (AI) in their healthcare decisions. Despite ongoing debates regarding algorithmic fairness and concerns about overreliance on AI for decision-making (Buçinca et al., 2021; Schemmer et al., 2022), recent advancements in AI technologies have facilitated their integration into healthcare areas such as health information systems, predictive modeling, and decision support, ultimately reshaping healthcare practices (Secinaro et al., 2021; Suryakiran, 2023).

A key factor in positioning AI as an assistive tool in healthcare is how health consumers view it, including their ideological views, or a set of ideas and beliefs that form the basis of social, political, and economic practices. This ideology significantly impacts how individuals engage with AI systems (Chen & Décary, 2019). In the healthcare context, where decisions can have life-altering consequences, ideologies such as trust in medical technologies are particularly crucial for successful integration. Research indicates, however, that citizens often hold a dualistic view of AI, optimistic about its potential benefits yet skeptical about its reliability in critical healthcare contexts (Fritsch et al., 2022). Studies also report mixed findings regarding citizens' views on real-world applications of AI. For example, Isaksen et al., (2025) argued that hands-on experience with AI can lead to more favorable perceptions, while Sobaih et al., (2025) suggesting that early exposures may heighten anxiety and uncertainty. Despite their mixed findings, these previous studies underscore that the variability of citizens' attitudes toward AI adoption, whether optimistic or skeptical, plays a key role in determining the effectiveness of AI systems in addressing users' needs (Richardson et al., 2022). Besides, citizens' views toward AI systems vary by the context of AI adoption (Ingrams et al., 2022). Therefore, successful AI adoption in healthcare requires a nuanced understanding of how health consumers' perceptions shape their acceptance and use of AI technologies. To address this, this study seeks to explore how citizens' ideologies are related to their perceptions of AI applications in healthcare.

The findings empirically link citizens' ideological orientations and general perceptions of AI with their attitudes toward its adoption in healthcare, using a large, nationally representative dataset. It also informs policymakers and the development of AI systems that are better aligned with public values and concerns, ultimately enhancing their effectiveness in healthcare settings.

METHOD
Data
This study analyzed survey responses from the Pew Research Center's American Trends Panel (ATP) Survey Wave 119, conducted in December 2022. The ATP panel is a nationally representative, random sample of U.S. adults(Pew Research Center, 2023). A total of 10,523 responses were analyzed in this study, after excluding 229 (2.1%) incomplete responses.

Measures and Data Analysis
This exploratory analysis aimed to examine citizens' perceptions of AI adoption in healthcare based on their general ideology and acceptance of AI in daily life. Four survey questions were selected for this purpose. Participants' general ideology, originally measured across five categories, was recoded into three categories (1= *conservative*, 2 = *moderate*, 3 = *liberal*). General acceptance of AI technologies was assessed with the question "*Overall, would you say the increased use of artificial intelligence (AI) in daily life makes you feel?*" using a three-point Likert scale (1 = *more concerned than excited*, 2 = *equally concerned and excited*, 3 = *more excited than concerned*). Optimism or skepticism about AI in healthcare was measured with the question, "Do you think the use of AI in health and

medicine to diagnose diseases and recommend treatments would lead to?" also using a three-point Likert scale (1= *worse health outcomes for patients*, 2 = *not make much difference*, 3 = *better health outcomes for patients*). The degree of AI adoption in healthcare was assessed with the question, "Thinking about the use of AI in health and medicine to diagnose diseases and recommend treatments, how comfortable are you?" using a binary scale (1 = *uncomfortable*, 2 = *comfortable*). Demographic and socioeconomic characteristics such as gender (male, female, other), age (18-29, 30-49, 50-64, 65+), education level (high school or less, some college, college graduate or more), ethnicity/race (White, Black or African American, Asian, mixed race, other), and income were also considered.

Chi-square tests of independence (Pearson, 1900) were conducted using SPSS 29.0, with p-values <0.05 considered significant. The null hypothesis posited that citizens' ideology and perceptions of AI are not associated with AI adoption in healthcare.

RESULTS

Slightly over half of the sample (52.4%, *n*=5637) were females. The largest age group was 30-49 years, accounting for 53.6% (*n*=5,637), followed by the 18-29 age group at 45.4% (*n*=47,74). Nearly half of the respondents (49.0%, *n*=5,267) held a college or graduate degree. The majority identified as White 72.8% (*n*=7829). The largest income group was middle income (47.1%, *n*=5064), followed by high income (23.8%, *n*=2,563).

Pearson's Chi-squared tests revealed a significant association between individuals' ideology and perspectives towards AI adoption in healthcare (see Table 1). Respondents' comfort with adopting AI for tasks such as diagnosing diseases and recommending treatments was significantly related to their ideology ($\chi^2(2) = 156.503$, $p < 0.001$). To illustrate, 22.92% of conservatives expressed discomfort with AI adoption, compared to 13.61% of liberals. Expectations regarding health outcomes are also associated with ideology ($\chi^2(4) = 249.261$, $p < .001$). For instance, 14.27% of conservatives expressed skepticism about AI adoption's impact on patient health outcomes, compared to 6.8% of liberals.

Additionally, a significant association was found between perceptions towards AI adoption in daily life and comfort with AI adoption in healthcare, ($\chi^2(2)= 1001.407$, $p < 0.001$). Similarly, respondents' expectations of AI's impact on health outcomes were significantly associated with their general perception towards AI use in daily life, ($\chi^2(2)= 1236.147$, $p < 0.001$). To illustrate, among those excited about AI adoption in daily life, only 2.37% felt AI would worsen health outcomes, while 11.26% expected it would improve them.

		Comfort level in adopting AI in healthcare. *n* (%)		Pearson's Chi-squared test	Expectations about the impact of AI on healthcare outcomes for patients *n* (%)			Pearson's Chi-squared test
		Uncomfortable	Comfortable		Worse	No difference	Better	
Ideology	Conservative	2,412 (22.92)	1,269 (12.06)	$\chi^2(2)$ =156.503 $p < 0.001$ φ=0.122	1,502 (14.27)	986 (9.37)	1,193 (11.34)	$\chi^2(4)$ =294.261 $p < 0.001$ φ=0.109
	Moderate	2,353 (22.36)	1,635 (15.54)		1,246 (11.84)	1,101 (10.46)	1,641 (15.59)	
	Liberal	1,432 (13.61)	1,422 (13.51)		716 (6.80)	720 (6.84)	1,418 (13.48)	
	Total	6,197 (58.89)	4,326 (41.11)		3,464 (32.92)	2,807 (26.67)	4,252 (40.41)	
AI in daily life	Concerned	3,000 (28.51)	965 (9.17)	$\chi^2(2)$ =100.407 $p < 0.001$ φ=0.308	1,920 (18.25)	1,053 (10.01)	992 (9.43)	$\chi^2(4)$ =1236.147 $p < 0.001$ φ=0.242
	Neutral	2,654 (25.22)	2,211 (21.01)		1,295 (12.31)	1,495 (14.21)	2075 (19.72)	
	Excited	543 (5.16)	1,150 (10.93)		249 (2.37)	259 (2.46)	1185 (11.26)	
	Total	6,197 (58.89)	4,326 (41.11)		3464 (32.92)	2807 (26.67)	4252 (40.41)	

Table 1. Crosstabulation of Responses to Towards AI Adoption in Healthcare by Ideology

CONCLUSION

The results suggest that citizens' views, such as ideology and perceptions toward AI technology, are significantly associated with their levels of feeling comfortable and expectations in the use of AI in healthcare. This finding aligns with previous research, which indicates that citizens tend to be more skeptical about AI systems being involved in complex value-added decisions such as healthcare, while they are more open to AI performing instrumental tasks (Park et al., 2023). Cultural Cognitive theory (Nisbett & Norenzayan, 2002) helps explain these differences, as it emphasizes how individuals' mental frameworks influence their perceptions and decisions, which can shape their acceptance of new technologies, such as AI. In future studies, I will examine how factors influencing

these varied ideologies, such as belief, personal experience, and trust, impact the adoption of AI in healthcare from the perspective of health consumers.

GENERATIVE AI USE

ChatGPT 3.0 was used to check for grammar errors.

AUTHOR ATTRIBUTION

Dr. Park, the author of this study, solely conducted all aspects of the research and manuscript preparation, including conceptualization, formal analysis, review, and editing.

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Wikipedia and AI for Mapping Cultural Diaspora

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ABSTRACT
This project explores how publicly sourced digital platforms, combined with generative AI, can support the study of cultural diaspora in the performing arts. Using ballet as a case study, we extracted data from 518 English Wikipedia entries and applied GPT-based models to structure information on premiere dates, locations, and creative contributors. We identify culturally significant locations and construct a bipartite network linking artists to ballet premiere cities, offering a framework to trace transnational creative flows that contribute to cultural diaspora. Our findings show that integrating human-curated data with AI-assisted structuring provides a valuable entry point for data-driven analysis of cultural mobility in understudied domains. This work contributes to growing efforts to bridge computational methods and the humanities through accessible and reproducible approaches.

KEYWORDS
Cultural diaspora; Performing arts; Wikipedia; Generative AI

INTRODUCTION
Cultural diaspora is shaped by centuries of political and societal movements (Adamson, 2012), institutional opportunity (Dzionek-Kozlowska and Matera, 2021), and human mobility (Sorokin, 2019). Among several reasons, individuals often migrate to pursue better career opportunities, in response to shifting economies, or due to environmental factors (Czaika and Reinprecht, 2022). Cultural mobility is also driven by the exploration and expansion of creative potential, where individuals seek to learn from new cultural contexts while contributing to them in a continuous feedback loop of intellectual exchange (Liu et al., 2021). In this work, we focus our exploration on ballet, a classical performing art of European origin that remains central to Western culture and has since then spread globally (Schich et al., 2014). We use a hybrid approach to integrate Wikipedia text information with GPT-based models to structure the data. From here, we aim to explore the potential of integrating human-curated knowledge repositories with generative AI to support the study of cultural mobility in domains traditionally approached through qualitative or humanities-based methods. We ask: Can publicly sourced platforms like Wikipedia be reliably used to extract structured information about artistic mobility? How effectively can generative AI models assist in identifying and organizing relevant biographical data within these platforms? What are the opportunities and limitations of this approach when applied to understudied fields, like ballet? And finally, how might such a method be refined and scaled to support broader research into the cultural dynamics of other artistic movements?

METHODS
Data Collection and Structuring
We scraped data from 518 entries listed on the English Wikipedia page titled List of ballets (https://en.wikipedia.org/wiki/List_of_ballets_by_title, accessed March 15, 2024). Ballet titles are the names of performance productions that have the same set of artistic elements. For example, the "*Sleeping Beauty"* entry describes the ballet history of the premiere, as well as other relevant productions. In some instances, different entries are created, particularly when the creative work deviates from the original production (e.g., Swan Lake - original, and Swan Lake - Balanchine). Each entry corresponds to a distinct ballet work with a dedicated Wikipedia article. The full text content of these pages was collected, including the structured and unstructured elements. We implemented GPT-based models (GPT-3.5 and GPT-4) via the OpenAI API to extract relevant information from each entry. The extraction focused on three main components: the location and year of the premiere, and the list of creative contributors associated with the production (e.g., choreographer, composer, librettist). Prompt templates were designed to instruct the models to identify and structure this information into a tabular format *(GitHub link is anonymized for the review process)*. The outputs were compiled into a structured CSV file. To assess the accuracy of the extraction, we manually collected and verified data for 128 entries (approximately 25% of the dataset) and computed a simple accuracy ratio by comparing model outputs against this curated subset. GPT-3.5 outperformed GPT-4, achieving an accuracy of 0.81 compared to 0.72.

Mobility Network Construction
From the structured dataset, we first explored the temporal distribution of listed ballet premieres to examine patterns of creative productivity over time. We then identified and mapped culturally significant locations based on the cities where ballet premieres and other productions occurred. To analyze the relationship between artists and premiere locations, we constructed a bipartite network represented as G = (A, C, E), where C = \{c_1, c_2, \ldots, c_n\} denotes the set of artists (ballet creators), A = \{a_1, a_2, \ldots, a_n\} the set of cities where ballets were premiered,

and E = \{(a_i, c_j) \mid a_i \in A, c_j \in C\} the set of directed edges from cities to artists. Each edge (a_i, c_j) indicates a creative contribution by artist c_j to a ballet premiered in city a_i, reflecting the geographic flow of artistic activity through cultural hubs.

RESULTS

From the 518 ballet titles collected, we extracted 1612 artists' names, including 383 (30%) were Composers, 343 (27%) Designers, 225 (18%) Choreographers, 178 (14%) Muses, 108 (8%) Librettists, and 38 (3%) Regisseurs. Contrary to the common expectation that choreographers are the central creative figures in ballet, this breakdown reveals a stronger presence of composers and designers, underscoring their foundational roles in shaping the musical and visual dimensions of ballet productions.

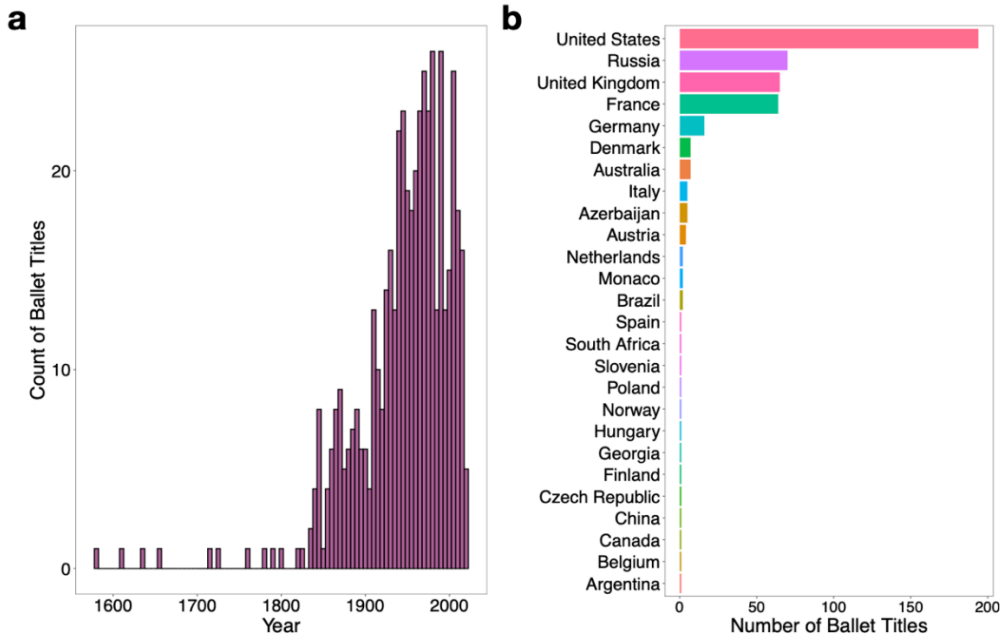

Figure 1. Panel *a* shows ballet title distribution over time. Panel *b* shows ballet title counts by country

Our dataset reveals that the majority of ballet titles were created after 1900, as shown in Figure 1a, reflecting the art form's intensification in the twentieth century. In Figure 1b, we examine the number of countries associated with these works. While 62 titles lack geographic attribution, we identify 26 countries linked to a single ballet and a handful of countries with sustained creative activity. France and Russia stand out with over 50 ballet titles each, a finding that aligns with their central roles in the historical development of ballet, from its formalization under Louis XIV to the artistic flourishing of the Imperial Russian Ballet. The United Kingdom also appears prominently, despite its relatively later adoption of the form, underscoring its role as a cultural hub in the global expansion of ballet. Notably, the United States emerges with the highest number of ballet titles, suggesting its contemporary leadership in ballet production and its capacity to absorb and reinvent traditions through artistic migration. The diversity of countries identified—including Australia, Azerbaijan, South Africa, Argentina, and Brazil—illustrates the global reach of ballet and the transnational nature of its creative infrastructure. Ballet has historically evolved through the transnational movement of artists, with figures like George Balanchine and Mikhail Baryshnikov exemplifying how mobility shapes creative influence. Network science offers a powerful lens to trace these patterns, revealing how artistic exchange flows across regions and how certain individuals and locations serve as key connectors in the global ballet landscape.

CONCLUSION

This study demonstrates the potential of combining publicly sourced digital platforms with generative AI to extract and structure biographical data in the performing arts. By focusing on ballet, we highlight how such methods can uncover patterns of cultural mobility. Our findings emphasize the value of data-driven approaches for mapping artistic networks and point toward new possibilities for studying cultural dynamics in domains traditionally grounded in qualitative analysis. Using publicly sourced records can help democratize the study of cultural mobility while revealing how public memory and digital documentation shape our understanding of the global performing arts landscape.

GENERATIVE AI USE

We employed OpenAI's GPT-based models (GPT-3.5 and GPT-4o) to assist in structuring unformatted textual data extracted from Wikipedia List of Ballets. The models were used to identify and extract relevant information about each ballet, including location and year of the premiere, as well as the corresponding ballet creators and their creative contribution. To evaluate the output, we manually structured a representative subset of the data and calculated the accuracy ratio for each model. This evaluation allowed us to compare model performance and refine our extraction approach. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

Peng: formal analysis; Lamba: methodology, supervision, writing – review and editing; Herrera-Guzmán: conceptualization, methodology, project administration, writing – original draft

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“The original PDF score is just completely inaccessible”: A Proposed Workflow for Making Archival Music Scores Accessible Using MEI

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ABSTRACT
Archivists often make music scores available online as PDFs, JPEGs, TIFFs, or other image-based files. But, for some Disabled users, such files can be inaccessible because they are incompatible with assistive technologies. So, using the Music Encoding Initiative (MEI), I devised a workflow to convert those image-based scores to accessible formats. This poster presents the results of a pilot study implementing that workflow on a set of 14 scores by Maria Theresia von Paradis to create Braille music notation (BRF), modified stave notation (MSN), and audio files (WAV). Experimentation and usability testing revealed that the workflow is successful but requires increased automation (especially optical music recognition, or OMR) to be realistically implemented across music archives.

KEYWORDS
music encoding initiative; disability; accessibility; music archives; music scores

INTRODUCTION
Archivists often make music scores available online as PDFs, JPEGs, TIFFs, or other image-based files (Pineo, 2025b). The Library of Congress’ recommended formats for music scores are, in order: musicXML, MEI, and any of the portable document formats (PDF/UA, PDF/A, PDF/X, and PDF) (Library of Congress, 2024). Among those, musicXML and MEI are the preferred formats (Library of Congress, 2024). Composers save most new music scores as PDFs (Akau, McKinney, & McNellis, 2023), and they are archived that way, but PDFs are often inaccessible to Disabled users because they can be incompatible with assistive technologies. Though musicXML and MEI files can be converted to accessible formats, they are less commonly used than image-based files (Pineo, 2025a). Consequently, many archival music scores remain inaccessible to Disabled users.

This study explores how music score archiving can evolve to improve accessibility. Using scores from Maria Theresia von Paradis (1759–1824), a Blind Classical composer, I developed and tested a workflow to convert PDF music scores into accessible formats: Braille Ready Format (BRF), modified stave notation (MSN), and Waveform Audio File Format (WAV). I assessed the workflow’s feasibility through usability testing, and its primary goal was to determine the efficacy and feasibility of the workflow by ensuring that the scores created are truly usable.

ARCHIVAL MUSIC SCORE ACCESSIBILITY
Many archival music scores have low color contrast or are image-only PDFs (Pineo, 2025b), which, akin to a photograph, are only visuals of the item being represented. For text-based PDFs, optical character recognition (OCR) can convert image-only documents to manipulable ones, but even the best optical music recognition (OMR) programs still struggle to achieve a high level of reliability (Faschi, Avanzini & Ludovico, 2025; Payne & Hurst, 2023) and are not usually compatible with screen readers.

To address accessibility challenges presented by PDF music scores (though not necessarily archival ones), previous work has explored the efficacy of talking music scores (Schuiling, 2023) and (audio-)haptic feedback for graphical scores (Karpodini & Michailidis, 2022). Presently, most score accessibility initiatives are based on musicXML (ChoirCommunity, n.d.; Higman, 2024; OpenScore, n.d.; Talking Scores, n.d.; The DAISY Consortium, 2024), which the workflow explored here also creates, making it compatible with such initiatives (see also: Payne & Hurst, 2023). Taking advantage of existing infrastructures by tying future accessibility initiatives to existing, growing communities—like the MEI community—will likely be imperative to their long-term success.

METHODS: WORKFLOW AND SURVEY
I designed and piloted an experimental workflow intended to convert image-based PDF music scores to accessible file types. The workflow (Figure 1) consists of 1) downloading the original score (in my case, from IMSLP); 2) entering the score manually into MuseScore; 3) exporting the score to musicXML; 4) using mei-friend, a browser-based MEI file editor, to create, clean up, and add metadata to the MEI file; 5) bringing the MEI file back into MuseScore; 6) exporting the score to BRF and WAV files and creating two types of MSN scores (one with colored noteheads and one with black); 7) uploading the completed files to Zenodo, GitHub, and IMSLP. Based on the 84 valid survey responses and the four usability tests I conducted, as discussed below, the most effective dissemination strategy for the created scores was to upload them to IMSLP, but I also uploaded them to Zenodo and GitHub to ensure they reached as many people as possible. Step 2 was by far the most labor-intensive; entering the scores into MuseScore took anywhere from ~1–2 hours per page of music, depending on its complexity.

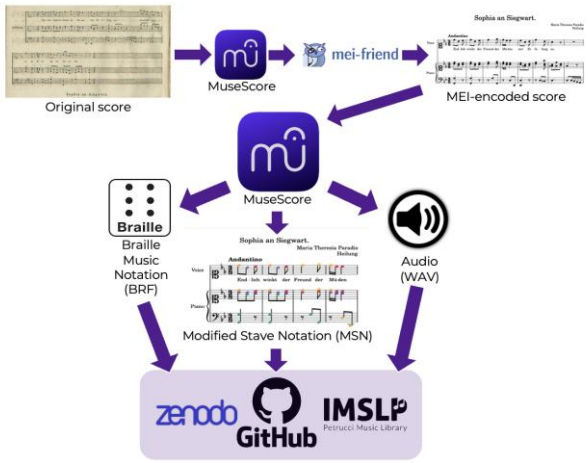

Figure 1. Step-by-step illustration of the workflow

I began this project by applying the workflow described above to a set of 14 scores by Maria Theresia von Paradis. After completing the workflow for one of the shorter pieces, I conducted usability testing on the resulting scores. To recruit usability test participants, I used a Qualtrics survey that inquired about how they found and used music scores. The study was IRB-exempt. The recruitment criteria were that participants were 18+ years old; live in the United States; identify as Disabled; and able to read piano and voice music (treble and bass clefs).

After 14 days, my survey had received 201 responses, of which 84 (41.8%) were valid for analysis. The criteria for that determination were: the survey was complete; the respondent took at least 300 seconds to complete the survey; and the respondent met all recruitment criteria. Of those 84, 75 (89.3%) said they would participate in a remote synchronous usability test. I invited 9 of those individuals to participate in a test based on the variety and depth of their survey responses. Ultimately, I carried out four tests. Two focused on BRF scores, and two focused on MSN scores. Two chose to use the WAV audio files, and two chose not to. All had at least a 4-year college degree, had at least 4 years of archival experience, and used some form of print-related assistive technology.

FINDINGS

Formatting Limitations: There were three prominent formatting issues with the BRF files that MuseScore cannot currently correct. First, the BRF file music started on the same line as the header information (title, composer, etc.) instead of a new line. Second, Braille music notation often does not use clefs, but MuseScore includes clefs in its files. Third, the BRF files did not include appended lyrics, which all of the scores for this project used. Ultimately, both participants testing the BRF files said that they were workable and far better to have than an image-based PDF.

Need for Compromise: Next, modified stave notation is a genre of score that encapsulates as many formatting options as there are users of it. One participant preferred colored note heads, while the other preferred black. Neither of my participants preferred labeled notes, but others might have. Preferences for font size were likewise varied. For this study, I used a minimum font size of 18 and used equivalent settings for non-text elements' size and spacing. For one participant, that was fine, but the other preferred something larger. Again, the MSN scores were overall workable, and both participants said they were useful. Meeting everyone's needs and preferences with an MSN score is probably impossible, but finding a compromise that works for most archival users is probably possible.

Audio Files are Useful: The WAV files were generally used in an auxiliary capacity to the BRF and MSN files, so they were not directly tested. However, both participants who used them indicated that they were helpful to have because they helped participants hear the score and tell them if there were any mistakes or oddities in it.

CONCLUSION

The goal of this study was to determine the efficacy and feasibility of the workflow by ensuring that the scores created were truly usable. The workflow successfully creates three types of accessible scores but needs greater automation (especially OMR advances) to be feasible for widespread use. Collaborations with MEI scholars looking at compositional workflows could be beneficial; if music scores are born in musicXML or MEI, OMR advances are no longer needed. Likewise, MEI is a preferred format at the Library of Congress (Library of Congress, 2024), but it can become a standard format at other archives too, which would make it easier to begin the workflow.

One participant, Abby (a pseudonym), noted that "[t]he original PDF score is just completely inaccessible." Greg (also a pseudonym), in his own test, stated that he was "unable to know anything" from the original PDF score. Archivists can change that reality, and they are powerfully positioned to do so. The workflow I have proposed herein can help archivists begin that long, vitally important journey.

GENERATIVE AI USE

I confirm that I did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author: conceptualization, methodology, data curation, formal analysis, funding acquisition, investigation, methodology, project administration, resources, visualization, writing – original draft, writing – review and editing.

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Time Out of Mind: Investigating the Technical and Ethical Impacts of Virtual Reality Tools in Archaeological Studies

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ABSTRACT
Modern virtual reality (VR) and augmented reality (AR) tools possess advanced capabilities that are reshaping archaeological education for public audiences in venues such as museums and schools. Research is needed to determine how these applications modify public perception and interaction with history and cultural heritage. This paper examines the perceptions of academic archaeologists regarding the integration of VR tools into archaeology education. We conducted semi-structured interviews with six archaeologists who either teach archaeology in a university or museum setting, or who work with archaeological materials in the field. We identified key concerns and perceived benefits related to VR integration in these settings. This preliminary assessment highlights areas of consensus and divergence among archaeology professionals and suggests areas for future research into the evolving role of VR tools in archaeological studies.

KEYWORDS
Virtual Reality; Archaeology; Education; Pedagogy; Technology

INTRODUCTION
Humanities education is evolving rapidly due to recent technological advances that have increased the speed of wireless connectivity, made graphics more realistic, and reduced the costs of equipment (Velev, Zlateva, 2017). Contemporary virtual reality (VR) devices offer tremendous promise for archaeological education because of their ability to simulate a sense of place or presence in the user (Falconer, et al, 2020). However, there is also the potential for deception, manipulation, and social engineering (Harley, 2020; Rubo, et al, 2021). The sense of presence engendered by VR experiences can be profound and may convince the user that the virtual content itself is reality (Rubo, et al, 2021). Therefore, misleading educational content delivered by VR platforms may cause significant harm. This is particularly true of historical information and related fields of study such as archaeology, the corruption of which could seriously undermine social stability at local, national, and even global levels. Thus, it is imperative that archaeologists establish and maintain a common understanding of best practices for the educational use of VR. This study investigates the following research questions:

1) What hopes and concerns do professional archaeologists have regarding the use of VR or AR tools to educate audiences about archaeology and/or history?
2) How do professional archaeologists propose handling issues regarding accuracy, morality, and safety in virtual education environments?

Virtual reality tools and applications are already having an enormous impact on education involving history and archaeology (Stephan, et al., 2025; Plecher, et al., 2022; Villena-Taranilla, et al., 2022). While VR offers many tantalizing affordances for education, misuse or poor design could distort an individual's understanding of past events and render them vulnerable to disinformation and manipulation (Skulmowski, 2023). While the sample for this study is limited, its initial assessment of perspectives and practices among archaeologists regarding VR provides a template for further research.

LITERATURE REVIEW
Interest in virtual reality (VR) technology for educational purposes has shown profound growth in recent years (Wei & Yuan, 2023; Waagen, et. al., 2024; Samala, et al., 2023). Early efforts to integrate VR into education faced significant challenges for widespread adoption such as cost, the need for continuous training and professional development for teachers, and institutional resistance (Wang, 2024; Ravichandran & Mahapatra, 2023; Nemani, 2025). Nevertheless, VR has elicited excitement in the popular imagination since the 1980s (McLellan, 1994; Helsel, 1992) and advances in producing powerful but affordable computers have demonstrated that VR has the potential to transform education (Martin-Gutierrez, et al., 2017; Fabris, et al., 2019). VR has significant implications for informational tasks involving interaction with spatial contexts and technical skills (Yondjo & Siette, 2024; Parkhomenko, et al., 2018). As such, VR programs are well adapted to the needs of archaeology education, which is an inherently visual and spatial discipline (Cobb, et al., 2024). Moreover, VR tools offer an effective means of protecting ecologically vulnerable archaeological attractions such as shipwrecks while simultaneously increasing access for the global public (Ricca, et al., 2020; Skublewska-Paszkowka, et al., 2023). However, there are questions about accuracy and morality (Fisher & Schoemann, 2018), cultural bias (Barbara, et al., 2021), and accessibility

(Richards-Rissetto, 2022). Despite these concerns, VR tools have proliferated widely in museums and archaeological education (Bruno, et al., 2019; Shehade, Stylianou-Lambert, 2020). There are a wide variety of implementation strategies for virtual reality in education, but few studies have examined this process for history, archaeology, or anthropology (Gunawan, et al., 2023). Thus, there is a lack of knowledge regarding effective frameworks for the integration of virtual reality in archaeological education (Anastasovitis, et al., 2024). Implementation strategies should emphasize collaboration, prioritize the development of activities for handling objects, and enable students to interact with 3D models of archaeological sites before, during, and after excavation (Cobb, et al., 2024). Students' self-efficacy is increased when librarians and technologists work with instructors to design VR activities (Lischer-Katz, et al., 2019).

DATA AND METHODS

This project conducted semi-structured interviews with six academic archaeologists to gather their experiences and opinions on using VR in educational settings related to archaeology. We used our personal networks to produce the initial sampling set of interview participants and then contacted future participants through snowball sampling (Wildemuth, 2017). The interviews were conducted either in person or via Zoom, each lasting approximately 30-45 minutes. During the interviews, we asked participants a series of questions that focused on the affordances and threats of VR, best practices for its use, how they have used these tools, the critical assessments of their use, and overall opinions for the further use of VR technology in archaeological education. All interviews were audio-recorded for transcription and analysis. This exploratory study employed manual open coding of the transcriptions to identify trends in assessment and implementation of VR tools.

PRELIMINARY RESULTS AND DISCUSSION

Early results from this study identified positive perceptions, concerns, and ideal practices for incorporating VR in teaching among archaeology professionals. Importantly, VR can ***incorporate the memories and perspectives of indigenous peoples*** to provide better and more balanced perspectives of observed materials and sites (Participants 1-4). "A big advantage is that now you're able to add layers of real stories from descendant nations and replace much of the narration (Participant 2)." VR may ***enhance storytelling*** by offering users the opportunity to experience history and archaeological materials subjectively (Participants 1-3, 6). "You must be a good storyteller so your visitors can use their imagination and picture what you're talking about. VR allows us to build that world out more (Participant 1)." VR is also a ***useful archival tool*** that can be used to preserve multiple recreations of a site for future study (Participants 1, 3-6). "There are many ways of interpreting an archaeological site. But it's rare that we can get to the exact truth. With VR, we could present different hypotheses to the public, and the storage of that data would be useful for further research (Participant 3)."

Despite these potential benefits, the study revealed significant concerns among archaeologists about the implementation of VR tools in their field. ***Concerns about costs and logistics*** were broadly shared (Participants 1-6). "For us, being a state agency, cost is the biggest concern for VR programming. Otherwise, a lot of us are open to using VR in some format (Participant 1)." Opinions diverged as to the best way to mitigate the costs. One opinion was that museum VR opportunities should be accessible using personal technology devices, such as smartphones and iPads (Participants 2, 6), while another argued for the value of "communal" VR experiences in dome-like structures (Participant 1). While virtual environments may help users to better understand the physical details of a structure, they ***cannot adequately capture the information of external locations and landscapes*** (Participants 2, 4), which is a significant hindrance for archaeological projects where geolocation and a sense of the surrounding environment are critical. "VR can give you images and a sense of scale, but if you want to understand how people lived, you have to be there to feel, hear, and smell the environment (Participant 4)." Another concern is that VR landscapes of archaeological sites ***may enable looters to more effectively pillage artifacts***. "In archaeology there is a long history, particularly in North America, of taking things from indigenous communities. My immediate concern is, are we providing a path to looting these things? (Participant 5)." Finally, there are ***significant anxieties about accessibility*** (Participants 1-6) and the difficulty of head-mounted displays for some users may warrant the use of alternatives. "Other than a head-mounted display, you could look through the window of your phone or iPad and see stored 3D assets or information boxes, things like that. Especially for public outreach programs, augmented reality (rather than virtual) may solve a lot of the accessibility and logistical problems (Participant 6)."

CONCLUSION

This pilot study identified hopes, concerns, and typical use cases regarding VR among academic archaeologists and identified points of future interest. While some see the potential for VR to have transformative effects on archaeological education and become a ***mainstream*** tool (Participants 1, 3), others believe that impediments to use such as accessibility and cost mean that VR will be a ***unique*** tool to be deployed for specific circumstances (Participants 2, 4, 5). Another view is that VR has potential, but experimental work needs to be done to assess its viability for mass adoption (Participant 6). Additional research will clarify these points of consensus and divergence to help develop a framework for the implementation and use of VR in archaeological education.

GENERATIVE AI USE

We employed GPT-4 for grammar check and stylistic edits. We evaluated the output by carefully reviewing and revising the AI-generated recommendations. The author assumes all responsibility for the content of this submission.

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Disinformation Recognition in Social Media: Effects of Multimodality, Comments and Virality Metrics

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ABSTRACT
Multimodal disinformation (MD) has become more widespread in social media, raising the importance of information credibility research in this context. Meanwhile, engagement cues like comments and virality metrics may influence online credibility assessment. Using a between-subjects experiment, we examined the main and interaction effects of multimodality, comments, and virality metrics on disinformation recognition. Our results unexpectedly revealed that MD is easier to recognize than unimodal disinformation. Further, multimodality could attenuate the impact of comments and virality metrics, making people more susceptible to disinformation. Based on these findings, we discussed the theoretical and practical implications.

KEYWORDS
Multimodal Disinformation, Social Media, Comments, Virality Metrics, Credibility

INTRODUCTION
With the rapid development of AI technologies, audiovisual synthesis and manipulation have become increasingly sophisticated (Atlam et al., 2025). This has intensified the problems of multimodal disinformation (MD). MD refers to false content presented with multiple information formats (e.g., text, images, video, and audio), aiming to deceive audiences (J. Lee et al., 2023; Q. Li et al., 2024). In online contexts, it typically involves the integration of visuals and texts, such as fake news posts with deepfake videos. Compared to unimodal forms, such multimodalities appear more vivid and credible (J. Lee & Shin, 2022), which poses greater difficulty for individuals to identify MD.

Social media platforms have emerged as primary channels for MD proliferation (Zhang et al., 2025). Within these platforms, users engage with others by commenting, sharing, or liking specific posts. Notably, user comments are a double-edged sword. On the one hand, individuals may pose rebuttal comments exposing falsehoods (Colliander, 2019). On the other hand, online comments might distort the truth and mislead others (Anspach & Carlson, 2020).

Moreover, virality metrics are system-generated indicators that quantify the sum of user engagement (e.g., numbers of likes; Kim, 2018) and real-time popularity of content (Lee-Won et al., 2016). These metrics can influence one's disinformation recognition in social media. For instance, high virality was usually regarded as a social endorsement cue (S. Lee et al., 2021), increasing one's perceived veracity of content (Butler et al., 2023; Kim, 2018).

Taken together, multimodality, user comments, and virality metrics may influence individuals' disinformation recognition. However, existing research has mainly examined these factors in isolation, overlooking their potential interaction roles. Addressing this gap offers more nuanced insights into the underlying causes behind one's susceptibility to MD. Hence, we propose the following research question: *How do multimodality, comments, and virality metrics independently and interactively influence disinformation recognition in social media?*

THEORETICAL FOUNDATION AND HYPOTHESES
According to the multimodal framing theory (MFT; Geise & Baden, 2015), visuals and texts can complement each other in meaning construction. Thus, their integration is more persuasive than unimodal forms. Further, the social proof theory (SPT) posits that individuals tend to rely on others' behaviors or opinions to guide their decision-making (Cialdini, 1993), especially in uncertain situations (Cialdini & Goldstein, 2004). As visuals can provide an indexical reference to reality (Messaris & Abraham, 2001), multimodal settings may reduce people's perceived uncertainty in disinformation recognition, thus lessening their reliance on social proofs from engagement cues.

Synthesizing these perspectives, three hypotheses are proposed: **H1:** Multimodality (vs. unimodality) will decrease disinformation recognition; **H2: (a)** Rebuttal (vs. supportive) comments will increase disinformation recognition, **(b)** but this effect will be weakened in multimodal (vs. unimodal) settings; **H3: (a)** High (vs. low) virality metrics will decrease disinformation recognition, **(b)** but this effect will be weakened in multimodal (vs. unimodal) settings.

METHODOLOGY
A 2 (Modalities: Unimodality vs Multimodality) × 2 (Comments: Rebuttal vs Supportive) × 2 (Virality Metrics: Low vs High) between-subjects experiment was conducted. As entertainment-related disinformation is both common and harmful (Gao, 2023; M. Li & Wan, 2023), we created eight simulated X (formerly Twitter) posts as stimuli using a deepfake video featuring Tom Cruise. Modality was manipulated by showing posts either in text-with-deepfake video or text-only formats. Comments were manipulated by showing three rebuttal or supportive comments. Virality metrics were manipulated by presenting low or high numbers of views, reposts, and likes.

A total of 281 valid participants (182 females; M_{age} = 27.26) were recruited online. Participants were randomly assigned to view one of the eight posts in the Qualtrics platform. Next, they were asked to complete a questionnaire, which collected data of three parts: (1) disinformation recognition, (2) manipulation checks, and (3) demographics.

Disinformation recognition (r = .516, p < .001) was measured using two items adapted from Hameleers (2023). Participants were asked to report the degree to which they believed the post was *disinformation* and *misleading.* All manipulation checks were conducted using single-item measures, such as *"I think there is a video in this post."* In terms of demographics, we collected participants' information about gender and age.

RESULTS

The data were analyzed in SPSS Statistics 27. All stimulus manipulations were successful, indicating that our experimental design was effective. Next, to test our hypotheses, we conducted analyses of variance (ANOVA). First, we found that modality had significant main effects on disinformation recognition (F(1, 273) = 5.495, p = .020, η_p^2 = .020). Unexpectedly, multimodality (M = 3.78, *SD* =.80) led to higher disinformation recognition than unimodality (M = 3.56, *SD* = .84), showing a significantly contrary effect of H1's expectation.

Second, our results showed no significant main effects of comments or virality metrics on disinformation recognition (both $p > .050$), indicating no support for H2a and H3a. However, we observed significant interaction effects of modality with comments (F(1, 273) = 4.063, p = .045, η_p^2 = .015) and virality metrics (F(1, 273) = 4.291, p = .039, η_p^2 = .015). Specifically, both comments ($M_{rebuttal}$ = 3.73, *SD* = .78; $M_{supportive}$ = 3.38, *SD* = .86) and virality metrics (M_{low} = 3.72, *SD* = .82; M_{high} = 3.39, *SD* = .83) had significant effects on disinformation recognition in the unimodality conditions (both $p_{\Delta M}$ < .050). Yet, in multimodal conditions, no significant effect was observed for both factors (both $p_{\Delta M}$ > .050). Thus, H2b and H3b were supported. Figure 1 presents the above ANOVA results.

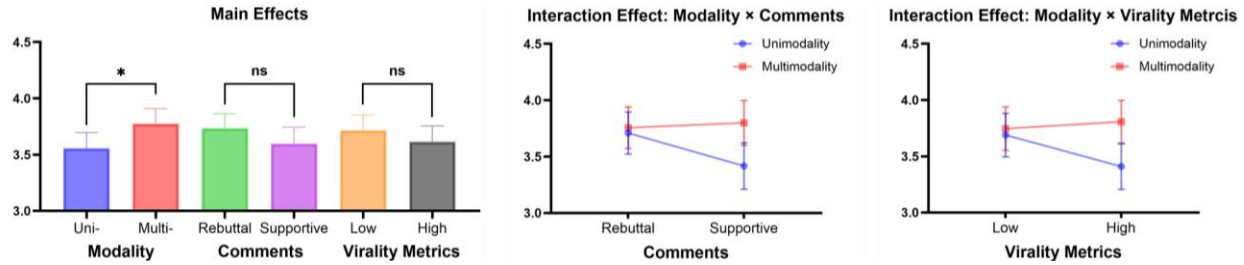

Figure 1. ANOVA Results of Hypothesis Tests (* = p < .050; ns = Not Support)

DISCUSSION AND CONCLUSION

This study has two key findings. One, contrary to our expectation and prior studies (e.g., J. Lee & Shin, 2022), we found that MD was easier to recognize than text-only unimodal disinformation. This surprising result can be interpreted using schema theory (Axelrod, 1973), which suggests that individuals often use schemas (i.e., cognitive structures) during information interpretation. Since MD provides more audiovisual cues than unimodal forms, it may activate a greater variety of schemas for judgment-making, thereby facilitating disinformation recognition. Two, we found that multimodality can attenuate the impact of comments and virality metrics on disinformation recognition. Here, a plausible explanation is that visual-based multimodality is more powerful in shaping meaning (Geise & Baden, 2015). Also, visuals can quickly trigger one's credibility heuristics (Sundar, 2008). Therefore, individuals may be able to make judgments easily, relying less on social influences (Cialdini & Goldstein, 2004).

Our findings offer the following implications. Theoretically, we bridge the MFT and SPT, highlighting their interaction roles in information evaluation contexts. This integration explains why individuals are vulnerable to MD in social media. Given that social factors are critical cues for credibility assessment (Metzger et al., 2010), it may not be multimodality itself, but its attenuating effect on one's reliance on social proof that contributes to increased susceptibility to MD. Relatedly and practically, we suggest that compared to social approaches (e.g., crowdsourced feedback), practitioners can deploy "visual-embedding" interventions (e.g., fact-check watermarks) to combat MD.

This study has limitations that could inform subsequent research. First, the mechanisms behind the observed effects are still underexplored. Future work can investigate these processes, potentially including more non-entertainment topics to enhance research validity. Second, this study merely focused on cognitive outcomes (i.e., recognition). Subsequent studies could expand the scope by incorporating behavioral variables, such as the sharing intention.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

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AUTHOR ATTRIBUTION

First Author: conceptualization, investigation, data curation, formal analysis, writing – original draft; Second Author: conceptualization, funding acquisition, supervision, writing – review & editing.

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From Field to Database: Scientists' Information Practices for Discovery and Management of Scientific Samples

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ABSTRACT
Scientific research frequently relies upon material samples (e.g. rocks, fossils, tissue samples, etc.) as a primary element for reference and study. Across disciplines, particularly in the natural sciences, observations made on samples collected in the field or synthesized in the laboratory constitute a critical data resource. Nevertheless, the management of information about and derived from samples (e.g. handwritten field notes, photos, sub-sampled products, digital data products) remains a significant challenge. Proper curation and archival of this information is crucial to ensuring the reusability of samples, but little is known about what information is most important to researchers seeking to find and reuse samples. In this poster, we present preliminary results of an on-going study examining the "sample-seeking behavior" of researchers. Our work directly informs the improvement of sample database architecture and search user interfaces to support scientists in more efficiently discovering useful and usable samples and sample metadata.

KEYWORDS
data reuse; digital archive; samples; user behaviors; information-seeking

INTRODUCTION
Material samples (e.g., rocks, fossils, herbarium specimens, animal skeletons) constitute a primary element of study for many scientific disciplines, including the natural and environmental sciences, material sciences, and archaeological science. These samples represent some of the most foundational – and reusable – "data" in the sciences; when properly curated, they can be subsampled and reanalyzed for many new purposes over their often decades-long lifespans (National Academies of Sciences, Engineering, and Medicine, 2020; Thomer, 2017). Despite their importance, finding samples to reuse (either in managed museum collections or in personal researcher collections, for instance) remains a significant challenge across the sciences. Sample metadata records, which make it possible to find and reuse samples, are often siloed within individual institutional catalogs, which may or may not be online and publicly accessible, or may be altogether nonexistent (in the case of individual researchers, who may only report sample metadata when describing the sample in a scholarly publication). When metadata records do exist, little is known about what types of information researchers need to make sense of the sample record and determine fitness for reuse, nor about the ways in which researchers search for and discover samples to use in their work (Ramdeen, 2017; Thomer, 2022). Recent studies have examined sample data curation and reuse from the lens of collections managers (Bishop et al., 2023; Thomer, 2017, 2022), but researcher information practices around samples and sample reuse remain less studied. Recent work has highlighted the insufficiency of four key human information behavior theories to describe user search strategies for data and emphasizes user reliance on metadata and documentation for evaluating data relevance (Million et al., 2025): we consider how search strategies and sensemaking behaviors for sample records differ from those used in data search.

METHOD: SEMI-STRUCTURED INTERVIEWS AND GRAPHIC USER INTERFACE "THINK-ALOUDS"
We employed a two-pronged approach to gather information about the sample collection, reuse, discovery, and metadata management practices of scientists who use physical samples in their research. We ask: (1) How do researchers evaluate the quality and usability of scientific samples via metadata records?, and (2) What system affordances or data attributes do researchers need to find samples? Twelve participants participated in interviews and/or user interface "think alouds," with five participants participating in both. Participants derived from the following disciplines: (earth science, n = 9; zooarchaeology, n = 1; ecology, n = 1; biology, n = 1). Participants were recruited via posts to disciplinary listservs, at conference booths, and via snowball sampling.

Semi-structured interviews
Semi-structured interviews (n=9) were conducted in person (n=3), via Zoom (n=5), and via phone (n=1). In each case, audio was recorded and transcribed. Transcripts were thematically coded using NVivo software.

User interface "think alouds"
Screen-recorded "think alouds" were conducted in person (n=7) and via Zoom (n=1) using two web browser-based searchable sample discovery portals (Figure 1). The first system, the System for Earth and Extraterrestrial Sample Registration (SESAR) is a 20 year-old system that serves as both a sample metadata archive and a publicly

accessible searchable sample catalog catering primarily to earth and environmental science researchers. The second system, iSamples Central, is an experimental aggregator for cross-disciplinary samples, surfacing archaeology, biology, paleontology, and geology samples (including SESAR's catalog). During think alouds, participants were asked to search for a sample or samples that would be of relevance to their research using one of the two search interfaces, and to verbalize their thoughts while moving through the web interface.

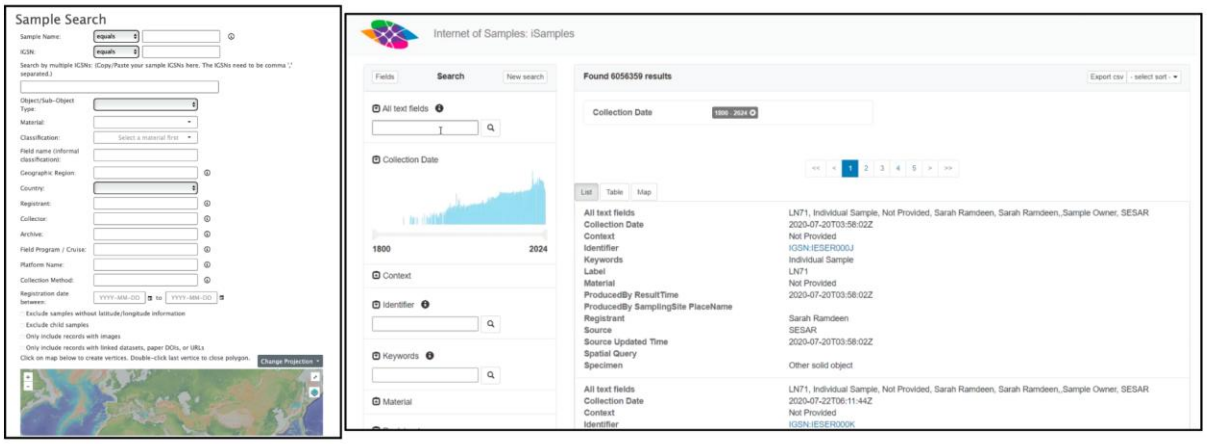

Figure 1. Examples of two sample search portals employed during user "think-alouds" (SESAR, left; iSamples, right). Both web-based interfaces enable a combination of faceting, free text, and map-based searching.

CONCLUSION

Just as data seeking behavior is distinct from other forms of information seeking behavior (Million et al., 2025), physical sample search is distinct from other forms of data search. From these early results, we find that photos are important in sensemaking, and that access to related publications and data is important in assessing fitness for use. Researchers are more likely to trust formally curated collections than personal collections. Taken together, our results can be used to inform improvements to user-centered sample discovery web interfaces and database architectures to better support the nuanced search needs of sample seekers.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

NR: conceptualization (supporting), methodology, investigation, writing – original draft; AT: conceptualization (lead), methodology, writing – review and editing.

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“I Wish I Had More Time”: Investigating User Onboarding Methods in VR Immersive Analytics

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ABSTRACT

Immersive analytics (IA) leverages immersive and interactive technologies to support data exploration, comprehension, and decision-making by presenting large volumes of multimodal data in virtual environments. However, the complexity of these systems can pose significant challenges for users, particularly during initial engagement. Effective onboarding is essential to help users acclimate to the environment and learn interaction techniques. In this work, we present findings from a study evaluating three onboarding methods for virtual reality-based IA systems: a desktop tutorial, in-Virtual Reality (VR) training, and self-guided exploration. Results indicate that most participants preferred a combination of all three approaches and emphasized the importance of early access to training components that may require additional time to understand.

KEYWORDS

Human-Computer Interaction, Virtual Reality, Immersive Analytics, User Onboarding

INTRODUCTION

Immersive analytics is an interdisciplinary field that seeks to improve data understanding and decision-making through immersive and interactive technologies such as virtual and augmented reality (Dwyer et al., 2018; Scarbez et al., 2019). By drawing on data visualization, immersive environments, and human-computer interaction, IA transforms how users engage with complex data (Chandler et al., 2015). Using these complex technologies can be challenging, making effective onboarding crucial to ensure usability and engagement. Onboarding in technology contexts means the “sum of methods and elements helping a new user to become familiar with a digital product” (Renz et al., 2014). Andersen et al. (2012) showed that while the introduction of onboarding tutorials in simple games did not make an impact, they significantly boost engagement in complex systems. This study explores three onboarding approaches for complex IA systems, comparing user perceptions of their usability and utility. The design of the onboarding approaches in this study are in line with the design guidelines presented by Morgan-Davies et al. (2022). Following Chauvergne et al. (2023), who emphasize the synergy between tutorials and instructor-guided onboarding in VR, our approach includes both out-of-context (desktop tutorial) and context-aware methods (instructor-guided training and self-exploration). Our goal is to inform the design of more effective onboarding strategies for immersive analytics environments. Our findings aim to identify which combinations of methods users perceive as most usable and helpful for engaging with complex systems.

CONTEXT

This study takes place within the Systems Exploration and Engagement environment (SEEe), a complex VR-based immersive analytics system accessed via the Meta Quest Pro headset. Designed for pre- and in-service teachers, SEEe integrates quantitative and qualitative educational data in an interactive visualization environment. Users explore bar graphs on geographic maps alongside multimedia content and construct conceptual diagrams to represent insights and data relationships (Figure 1a). Interaction is facilitated through a controller-based menu (Figure 1b), with navigation via physical movement or teleportation.

METHODS

We recruited 18 participants (11 women, 6 men, 1 non-binary), all with some background in K–12 education. The study involved two sessions. Session 1 (virtual) introduced the study, gathered demographics, and assessed prior knowledge of conceptual modeling through a questionnaire and a 2D diagramming task using FigJam. Session 2 (in-person) included a spatial ability test (Vz-2-BRACE) (which measures the capacity to mentally manipulate and reason about spatial relationships), VR training on the SEEe system, and a 30-minute sensemaking task in VR using the think-aloud method (Otago, 2007; Pellegrino et al., 1984). Afterwards, participants completed a post-task interview and questionnaire, including reflections on the onboarding experience.

Figure 1a. Immersive analytics system with media screens, a layered data map, and an interactive conceptual diagram (left). Figure 1b. Controller-based menu for interacting with elements in the space (right).

To onboard participants to the VR system, we used a three-part training approach: (1) an out-of-VR tutorial using PowerPoint and a Figma prototype on a desktop (Figure 2a), (2) instructor-led in-VR training with guided instructions and practice tasks (Figure 2b), and (3) a self-exploration phase where participants interacted with the system through trial and error.

Figure 2a. The Figma Prototype used During the Tutorial Phase (left), and Figure 2b. A Researcher Providing Guided Instructions to a Participant Wearing the VR Headset (right).

FINDINGS

Survey responses showed overwhelming preference for a combination of the three methods. Most participants (11 of 18) found all three methods—2D tutorial, VR training, and self-exploration—helpful. Three preferred only VR training, five favored self-exploration, one chose tutorial plus self-exploration, and two preferred VR training with self-exploration.

Most participants found the Figma tutorial prototype useful for conceptual preparation, describing it as "helpful," "easy to learn," and "quick to pick up." It supported their understanding of diagramming, helped them acclimate to key concepts, and eased the transition into the 3D VR environment. P2 shared, *"I think the Figma prototype helped acclimate me with the concept(s) of diagramming and connecting nodes,"* while P12 noted, *"The menu model allowed me to understand what I would see and give a general idea of options."* However, a few participants faced challenges, such as limited time to explore the tool, and suggested providing early access to the Figma tool. P5 remarked, *"Definitely a good resource, but I wish I got more time with it—could this be given out after Session 1?"*

The analysis of spatial ability scores and prior VR and gaming experience showed no clear relationship emerging between these factors and participants' preferences for onboarding methods.

CONCLUSIONS & FUTURE WORK

The findings of this study highlight that providing multiple methods of onboarding is useful for complex VR systems. In particular, providing a 2D tutorial outside of the VR environment supported users' transition into VR and offered low-stress onboarding. Once in the VR space, users found both the instructor-led tutorial and self-exploration useful. Future research could explore more flexible and adaptable onboarding approaches that personalize the experience based on users' prior knowledge and learning preferences within complex IA systems.

GENERATIVE AI USE

We employed Grammarly for the following purpose(s): to refine the text and check for grammatical errors. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

Priya Rajasagi: conceptualization, data curation, formal analysis, investigation, methodology, project administration, validation, visualization, writing – original draft; Hemanth Chelluri: formal analysis, investigation, writing – original draft; Kaoru Seki: formal analysis, investigation, writing – review and editing; Amy Tondreau: conceptualization, funding acquisition, methodology, supervision; Ryan Zuber: conceptualization, methodology, project administration, resources, software; Lee Boot: conceptualization, funding acquisition, methodology, project administration, resources, software, supervision; Anita Komlodi: conceptualization, formal analysis, funding acquisition, investigation, methodology, project administration, supervision, validation, writing – original draft

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Representation and Authenticity in AI Generated, Curated, and Mediated Archives

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ABSTRACT
Archival and information science scholars have begun to evaluate the impact of AI tools on how archival objects are created, used, and evaluated (Shinde, Kirstein, Ghosh, and Franks, 2024). Researchers have addressed a broad range of questions, including the evidential properties of AI generated archives, the use of large language models in supporting archival processing, and strategies for evaluating the authenticity and reliability of AI generated archives (Jaillant and Caputo, 2022; Reducindo and Olague, 2024; Wagner and Blewer, 2019). This initial work represented in the poster indicates a need to investigate questions pertaining to the evidential foundations and societal impacts of AI generated and mediated archives, and the potential and existing requirements for AI tools to enhance use of legacy and born-digital archival sources. This is significant for supporting traditional archival objectives in providing for and assessing reliability and authenticity (Arias Hernández and Rockembach, 2025). These issues are present at multiple stages of the archival life cycle – records creation, access, and evaluation and use – and are introduced and discussed broadly in this poster.

KEYWORDS
Representation; authenticity; visual information; media archives; assessment & use.

INTRODUCTION
AI tools present practical challenges to the evaluation, management, and use of contemporary and remediated archival sources, and opportunities for reconsidering traditional archival concepts of representation and authenticity. The authors of this poster consider archival practice within the context of AI generated archives, with an emphasis on questions concerning the authenticity and reliability of visual AI content, the use of AI tools to enhance accessibility of media archives, and strategies for developing a critical ethical assessment rubric in response to unregulated artificial intelligence (AI) applications. Collectively these micro-cases will provide a comprehensive overview, addressing questions of records creation, evaluation, use, and assessment and impact.

CONTEXTUALIZING AI THROUGH AN EVALUATION OF CONTEMPORARY ARCHIVAL PRACTICE
This poster will introduce this topic through a series of micro-case analyses and summarization of overarching themes. These are noted below.

Critical Application of an Artificial Intelligence Ethical Assessment Rubric in Archival Studies toward Sustainability
We identify key questions to engage the audience around developing a critical ethical assessment rubric in response to unregulated artificial intelligence (AI) applications within an entrenched field of archival studies, including both archival science and its practice, that predominantly stay white-centered, historically biased, and exclusionary (Cohen-Rodriguez and Norton-Wisla, 2024; Lee, 2017; Mehra and Gray, 2020; Poole and Todd-Diaz, 2023). AI has become a ubiquitous tool impacting every sphere of human activity problematically remaining unchecked in its uncontrolled adoption, growth, regulation, and use in technological policy development, public discourse, industry, news and social media outlets, or academic scholarship (Bastaki, Sedky, Campion, and Atkins, 2023; Yigitcanlar, 2021). AI and its associated supercomputing and digital storage capabilities are built on manipulation of resource extraction that has urgent ethical, social, and environmental ramifications to consider in a neoliberal global culture, such as potential for power misuse, oppression, injustices, and degrading environmental sustainability, amongst others (Tribelhorn, 2024). Archival studies in its territorialized elitist space of sole intellectualism and biased practice represents dysfunctional privilege, imbalanced power, and creation of unfair institutional policies closed to marginalized communities; these realities provide a rich, complex, problematized, and highly contested "information grounds" for critical analysis to question AI applications, relevance, and use (Fisher and Naumer, 2006; Savolainen, 2009). Inequities shape core principles in archival studies that attempt to ensure the long-term preservation and accessibility of historical materials, to question AI applications regarding their underlying philosophy, provenance, appraisal, arrangement, description, access, community collaborations, amongst others (Riter, Friedman, McDade, and Hirschy, 2023). We explore significant elements of a critical ethical assessment rubric applied to archival studies toward sustainability with consideration to issues of fairness and bias, transparency, accountability, privacy and security, and environmental and social impact, plus more. The discussion is valuable to diverse information

professionals, including information scientists, researchers, technocrats, archivists, librarians, educators, students, and others interested in considerations to sustainable growth and practice of AI in archival studies and related disciplines (broadly construed).

Benefits and Challenges of Using AI Tools in Visual Archives

AI tools present many benefits for improving aspects of archival practice, including automating appraisal and selection to make collections more diverse (Jaillant, et al., 2025), automating description and arrangement to save staff time, making search and retrieval more effective to improve access, and a range of other benefits identified in the archives community (Shinde, et al., 2024). Visual records (images, video, film, etc.) have been particularly challenging to process and adequately describe in archival collections (Andreano, 2007; Schlack, 2008), which has been linked to the characteristics of visual information and visual cultures of interpretation (Lischer-Katz, 2022). We explore the potential benefits and risks of using AI tools to improve access to visual records. It draws on earlier empirical findings on the visual information practices of media preservationists to explore how AI tools might improve workflows and at the same time generate tensions within archival practices and ethics. For instance, we might consider how AI tools could be used to help process collections of historical photographs, which might contain racist or other images that conflict with AI filters. Or if an AI model is trained on sets of intact images, how might it misinterpret damaged visual records? We also explore the risks associated with AI-generated images being widely disseminated and collected by archives in the future. This draws lessons about the complexities of images and visual interpretation from research in visual epistemologies (Drucker, 2014), visual information practice (Lischer-Katz, 2022), and theories of visuality (Foster, 1988) and images (Mitchell, 1994).

Representation and Authenticity in Visual Archives

How are concepts of authenticity expressed and evaluated in AI generated visual artifacts? The proliferation of AI generated visual artifacts illustrates the challenges these objects present for reader assessment and evaluation, both in terms of scale and form (Wagner and Blewer, 2019). This presentation provides an examination of the issues associated with determining representational integrity of AI generated visual archives. We will reflect on the way those visual images used for training AI generated visual artifacts likely do not source ethical nor representative samples of diverse populations. The implications of such likelihood reproduces and extends known issues with algorithmic bias and the need to resume technology and its design (Noble, 2018; Benjamin, 2019). Using queer archive as a case study, we will identify how the tenets of queer archival theory and those materials representative of queer history work to reject and obfuscate extraction and what such a refusal means for producing fictive and speculative visual archives within and beyond the paradigms of generative AI (Cifor, 2015; Lee, 2020).

Contextualizing AI Generated Archives: Understanding Context

All records, including those generated or co-created with the assistance of AI tools, are defined by the contexts of their creation. This provenance information is important for archivists and users in their individual evaluations of artifacts/collections for acquisition and use, and in determining their evidential potential. The absence of generative transparency provided by AI systems presents hindrances to these evaluations (Toy, 2023). This introduction provides an introductory analysis of the context of AI generated and co-generated archives, analyzing what is retrievable and proposing strategies for overcoming context gaps in archival evaluations (Colavizza, Blanke, Jeurgens, Noordegraaf, 2021). For purposes of specificity, this analysis will focus on correspondence as a record genre, acknowledging that each record genre requires individual investigation.

CONCLUSION

AI tools have the potential to influence the expression of fundamental archival concepts and practical operational principles, including the representation of individuals, communities, and organizations through archival sources, and the functional integrity of these sources. This necessitates a systematic review of these potential impacts, the development of analytical frameworks for evaluating and managing AI generated sources, and the enactment of critical frameworks for better understanding, and when appropriate remediating, these consequences.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this document.

AUTHOR ATTRIBUTION

First Author: project administration, conceptualization, methodology, investigation, writing – original draft, writing – review and editing; Second Author: conceptualization, methodology, investigation, writing – original draft, writing – review and editing; Third Author: conceptualization, methodology, investigation, writing – original draft, writing – review and editing; Fourth Author: methodology, investigation, writing – original draft, writing – review and editing; Fifth Author: methodology, investigation, writing – original draft, writing – review and editing; Sixth Author: methodology, investigation, writing – original draft, writing – review and editing.

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Data Governance in Practice: Disentangling the Socio-legal and Technical Dimension of Transportation Data

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ABSTRACT

Data governance in practice is shaped by a complex interplay of socio-legal frameworks, institutional arrangements, cultural attitudes, and technological capabilities. Understanding these interlinked dimensions is essential for effective management of information systems, particularly in sectors that are highly data-dependent for forecasting and delivering social services, like transportation. This study explores these dynamics through the specific case of vehicle speed data governance. Employing a mixed-methods approach, the research combines computational topic modeling using Latent Dirichlet Allocation (LDA) on a corpus of 237 policy and institutional documents with qualitative analysis to identify key governance themes. Findings reveal the prominence of national reporting mandates and technological adoption at the local level, alongside notable gaps in data lifecycle management and stewardship. To complement these insights, forthcoming interviews with data managers aim to clarify governance processes and challenges not evident in policy texts. This work advances our understanding of how socio-technical and legal factors collectively influence the governance and effectiveness of urban data infrastructures.

KEYWORDS

Data governance, socio-technical tensions, transportation data, institutional dynamics.

INTRODUCTION

Effective data governance does not emerge in isolation, but as result of a complex interplay of institutional arrangements, political tensions, cultural attitudes, technological affordances, resource availability, and inter-organizational collaboration (Abuljadail et al., 2023; da Cruz et al., 2023, Rakodi, 2003). As data becomes increasingly central to evidence-based policy, questions of how data is governed, who collects it, how it is shared, stored, and interpreted, become deeply embedded in broader socio-technical and socio-legal systems.

A clear example of these dynamics can be seen in the domain of transportation data in the US. While many cities and state-level bodies have developed systems for monitoring this kind of data, a fully harmonized federal framework for the collection, integration, storage, and analysis of many transportation categories remains lacking (Carballa, 2019; Green et al., 2018; Hall, 2017). Achieving this level of coordination requires more than just technical solutions. It demands a robust governance structure that facilitates interoperability and data sharing across institutions, including technology providers, state transportation agencies, research institutions, and federal bodies including the National Highway Transportation Safety (NHTSA), and the US Department of Transportation (USDOT). The ability to govern transportation data effectively, therefore, depends not only on infrastructure but also on the institutional and political landscape in which it is embedded.

This research examines how policies, cultural attitudes, and socio-technical factors shape the governance of vehicle speed data in transportation. The aim is to advance understanding of the process, domain expertise, technological infrastructures, and governance models that support the management of this type of data throughout its full life cycle, from collection and aggregation to delivery in the form of policy input and secure storage for advanced analytics. Beyond its technical management, this study also examines how vehicle speed data informs speed management strategies and enables further development of AI-based applications like automated traffic control, variable speed limits, smart cities, and autonomous vehicles.

To achieve these objectives, the study adopts a mix-methods approach consisting of a corpus definition of policy documents and its analysis to identify key themes using the Latent Dirichlet Allocation (LDA) model.

Preliminary findings suggest that data collection is primarily driven by national reporting mandates, while technological changes, rather than political transitions, have greater influence on local implementation practices, such as the growing use of dashboards. However, key aspects of data governance, including roles, responsibilities, and lifecycle routines, remain under-documented, underscoring the need for further inquiry through interviews with city- and state-level data managers.

METHODS

This study employs a mix-methods approach, consisting of a policy document corpus with computational topic modeling to identify key topics in the corpus. The goal is to characterize the roles, mechanisms, and strategic objectives of institutional actors involved in the governance of vehicle speed data. The analysis focuses on a sample of seven cities: Austin, Boston, Chicago, New York, Phoenix, Portland, and San Francisco. Cities selection was

based on prior research confirming the public availability of vehicle speed data (Salas & Adkins, 2024), ensuring the relevance and feasibility of the analysis by focusing only on cases where this specific data category is accessible.

A document corpus of 237 items was compiled to trace the historical evolution and institutional architecture of state-level transportation agencies and city-level transportation offices from 2000 to the present. These documents include both primary and secondary sources, such as legal and foundational texts (e.g., statutes, regulations, executive orders), annual reports, strategic plans, organizational charts, and policy documents related to agency reforms, including legislative debates and white papers. The selection process was guided by the goal of reconstructing institutional timelines, identifying shifts in jurisdictional authority, and examining how data governance responsibilities have emerged, evolved, or been contested over time.

An initial query using Google "vehicle speed data governance in [state/city name]" was conducted, followed by snowball sampling to identify additional relevant documents. These documents were retrieved from government websites, legal databases, institutional archives, and reputable news outlets. In the computational component, the defined corpus was analyzed using Latent Dirichlet Allocation (LDA) to conduct topic modeling. This probabilistic machine learning technique uncovers latent themes within a large set of unstructured text by identifying clusters of words that frequently co-occur across documents (Kang et al., 2021; Greene & Cross, 2017). This step supports the identification of key governance issues, recurring institutional concerns, and the underlying discourses shaping vehicle speed data policy.

RESULTS

Preliminary findings indicate that data collection practices of vehicle speed data are primarily driven by federal-level mandates focused on reporting metrics related to transportation network performance, and travel demand models. Government transitions at the local level appear to have a limited direct impact on the implementation or modification of data collection focus. Instead, technological advancements and the pursuit of administrative efficiency play a more influential role in shaping how data policies are enacted at the local level. The use of data dashboards for monitoring and accountability has become significantly more common across cities over the past five years.

While these developments highlight important dimensions of data governance (collection rationale, reporting mechanisms and technological uptake), other critical aspects remain largely absent from the policy documents analyzed. Specifically, there is limited detail regarding data lifecycle routines, institutional roles, and inter-agency responsibilities. This observation aligns with existing gaps in literature concerning data governance structures and the implications it has on information asymmetries, especially as they relate to the integration of AI-based technologies that will support the provision of mobility services.

CONCLUSION

This study highlights the importance of understanding data governance as the product of interlinked institutional, technological, legal, and cultural forces that collectively shape the structure and outcomes of information systems. Rather than existing as neutral technical frameworks, data governance regimes are embedded within complex socio-technical environments where mandates, administrative practices, resource constraints, and evolving technologies interact. Analyzing these dynamics across levels of government and institutional actors reveals that transportation data infrastructures are not only shaped by top-down policy, but also by localized interpretations, implementation mechanisms, and practical constraints.

This multi-dimensional perspective is essential for designing data governance structures that are both adaptable to innovation and aligned with principles of transparency, accountability, and equity. To uncover the implicit policies, operational practices, and institutional dynamics surrounding vehicle speed data, which are not fully captured in official documentation, interviews with city- and state-level data managers may clarify the practical and often informal mechanisms that shape data governance in practice.

GENERATIVE AI USE

I confirm that I did not use generative AI tools to author this submission

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Invisible Barriers: Chatbots, Language, and Access to SNAP Information

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ABSTRACT
As public agencies increasingly adopt chatbots to deliver essential services, questions of equitable access and usability become critical. This study presents findings from an audit of chatbot services on U.S. state-level Supplemental Nutrition Assistance Program (SNAP) websites, with a focus on language accessibility and user experience. Using an inductive, qualitative coding approach, we evaluated chatbot visibility, language support, interpretive nuance, and privacy features across 56 websites. Only 11 states featured chatbots and only 4 of those supported Spanish. Drawing on information gatekeeping theory and information poverty theory, we argue that these design limitations disproportionately affect marginalized users, particularly non-English speakers. Our findings highlight the need for inclusive, multilingual chatbot design to ensure equitable access to public information. Recommendations include bilingual parity, improved interface visibility, and user-centered feedback mechanisms.

KEYWORDS
Information Access, Information Poverty, Public Services, Language Equity, Digital Inclusion

INTRODUCTION
The Supplemental Nutrition Assistance Program (SNAP) is the largest federal nutrition assistance program in the United States, providing monthly benefits to low-income individuals and families to help them purchase food. As a vital safety net, SNAP plays a critical role in reducing food insecurity and supporting public health. However, accessing information about SNAP—such as eligibility requirements, application procedures, and benefit details can be complex, especially for individuals with limited digital literacy or English proficiency.

In the digital age, chatbots have emerged as frontline interfaces for accessing public information, including health and social services. These automated systems increasingly serve as the first point of contact for users seeking assistance. As such, they function as algorithmic gatekeepers—entities that filter, prioritize, and shape the flow of information (Barzilai-Nahon, 2009). This study situates chatbot audits within the broader context of information gatekeeping theory, which examines how control over access can reinforce or mitigate social inequalities. To further contextualize the societal impact of chatbot design, we also draw on Chatman's Theory of Information Poverty (1996). This theory posits that individuals in marginalized communities often face structural and cultural barriers that limit access to useful, trustworthy, or actionable information—even when technically available. These barriers may include language, literacy, trust in institutions, and perceived relevance of information sources.

In this light, chatbots that fail to support multilingual access or interpret nuanced queries may inadvertently contribute to information poverty by excluding users from critical services like SNAP. Our initiative seeks to address these disparities by developing policy and design guidelines for equitable chatbot deployment. Our focus on language equity—specifically the inclusion of Spanish alongside English—reflects the linguistic diversity of the U.S. population, where Spanish is the most widely spoken non-English language. By auditing existing SNAP chatbot implementations, we aim to identify both the best practices and critical gaps in current systems to inform more inclusive digital service design.

METHODS
We audited SNAP websites in all 50 U.S. states and 6 territories to evaluate chatbot availability and performance. Using the USDA SNAP directory and Google searches, we compiled a list of sites and manually reviewed each for chatbot presence and accessibility. We adopted an inductive, qualitative approach to develop our evaluation framework. One of the authors analyzed the features available at each of these websites related to SNAP eligibility, application procedures, and benefit details. Observations were recorded in free-form notes, allowing for open-ended documentation of user experience. The recorded data were then thematically coded to identify recurring patterns and emergent categories. Through iterative discussion, the evaluation dimensions identified were chatbot visibility, language support, interpretive nuance, and privacy messaging. This grounded, emergent approach enabled us to capture both expected and unanticipated aspects of chatbot functionality and accessibility, particularly as they relate to equitable information access for linguistically diverse populations.

RESULTS

Among the **56 SNAP websites** reviewed across U.S. states and territories, only **11 (19.6%)** featured a chatbot. All 11 of these chatbots supported **English**, while only **4** offered functionality in **Spanish**. Notably, **Montana** was the only state whose chatbot included a **built-in eligibility screener**, allowing users to assess their potential qualification for SNAP benefits directly through the interface.

Strengths of the audited chatbots include ***visibility***, ***support for privacy concerns,*** and ***user-feedback options***. Most websites contained a large "chat-bubble" icon to draw the user's attention. Some chatbots even opened immediately upon entering the SNAP website, enhancing visibility. Chatbot visibility was also more prominent on mobile devices. Upon starting a conversation with the chatbots, some delivered automated messages about privacy. For example, Missouri's chatbot started by stating, "I value your privacy, so please do not share any of your medical history or health with me." Finally, a few chatbots provide a feedback option, wherein users can "like" or "dislike" a chatbot response. After delivering this feedback, the chatbot confirms that the user's feedback was received.

Areas of improvement include ***inaccessibility***, ***difficulty interpreting nuance***, and ***unequal performance across different languages***. While some chatbots were prominently featured, others appeared as small icons in screen corners or were hard to find (e.g., hidden in obscure links). Most chatbots struggled with nuanced questions, often defaulting to generalized messages about SNAP benefits hyperlinked in English. While some offered equitable responses in English and Spanish, others failed to discern subtle question differences (e.g., "when" vs. "how") or interpret basic SNAP-related questions in Spanish, often defaulting to the keyword "SNAP" and linking to English-only pages. One Spanish chatbot could not interpret "SNAP" at all, either showing no understanding or providing no response. Findings suggest design guidelines for future chatbots. Such chatbots should be easily visible (e.g., large widget and "pop-up" upon entering the website), provide a privacy warning, prime users to its response capabilities, elicit real-time feedback, and recognize and respond to nuanced English and Spanish prompts equally.

DISCUSSION

Our findings highlight uneven digital access to public services, with chatbots functioning as both enablers and barriers. From the lens of information gatekeeping theory, chatbots act as algorithmic filters—determining who can access what information based on design choices like language support, interface visibility, and interpretive capabilities. These decisions shape the user experience and can either facilitate or hinder access to essential services.

At the same time, the inconsistent performance of chatbots in Spanish reflects a form of information poverty, as described by Elfreda Chatman. Even when information is technically available, marginalized users—particularly those with limited English proficiency—may be excluded due to poor language support, lack of cultural sensitivity, or limited trust in digital systems. This exclusion reinforces existing disparities in access to public resources.

To mitigate these issues, chatbot systems must be designed with equity and inclusion in mind. This includes ensuring bilingual parity in training and testing, using prominent, accessible interfaces, and incorporating privacy messaging and real-time feedback loops to build user trust. These features not only improve usability but also help ensure chatbots serve as inclusive digital gateways rather than reinforcing structural barriers. By grounding our analysis in both gatekeeping and information poverty theories, we emphasize the need for public-facing technologies to be critically examined—not just for functionality, but for their role in shaping equitable access to information.

CONCLUSION

As chatbots become increasingly common in public service delivery, their design plays a critical role in shaping equitable access to information. Our audit of SNAP websites reveals that while chatbots can enhance visibility and convenience, they often fall short in supporting multilingual users and interpreting nuanced queries. Drawing on information gatekeeping and information poverty theories, we argue that these shortcomings are not merely technical flaws but reflect deeper structural inequities. To ensure that digital tools serve all communities fairly, future chatbot development must prioritize inclusivity, linguistic equity, and user-centered design.

GENERATIVE AI USE

We employed Co-pilot to help revise the text for readability and flow. All ideas presented came from the authors, and they read and confirmed the content for correctness. The authors assume all responsibility for the content.

AUTHOR ATTRIBUTION

Salas: conceptualization, methodology, data curation, formal analysis, writing – original draft; Rivera: conceptualization, formal analysis, funding acquisition, writing – review and editing; Singh: conceptualization, methodology, project administration, funding acquisition, supervision, writing – review and editing.

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Refusal as a Community Practice: Organizing Teach-Ins on Smart City Surveillance with Brooklyn Public Libraries

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ABSTRACT
This poster details the findings from a study investigating the efficacy of community based and organized information sessions around New York Police Department smart city surveillance practices in New York City. The purpose of this research is to better understand localized perspectives on surveillance infrastructures within New York City and promote community dialogue through local public libraries and community groups as a mode of information activism.

KEYWORDS
Surveillance, Refusal, Smart Cities, Information Activism, Participatory Research

INTRODUCTION
The New York Police Department (NYPD) has adopted facial recognition technology in 22,000 cases between 2016 and 2019, installing more than 25,500 public and private cameras across traffic intersections in New York City as part of their smart city initiative (Cornebise, 2022). Recent research shows while citizens walk from W4 St/Wash Sq Subway station to and from Washington Square Park, they are surveilled 100% of the way by pan, tilt, and zoom cameras operated by New York Police Department (Cornebise, 2022). In the Bronx, Brooklyn and Queens, research from (Diaz, 2019) also showed that the higher the proportion of non-white residents, the higher the concentration of facial recognition compatible closed-circuit television (CCTV) cameras. Government agencies' use of facial recognition disproportionately impacts Black and Brown people because they are at greater risk of being misidentified and so falsely arrested (Buolamwini and Gebru, 2018)**.** Big tech companies are heavily invested in NYC smart city initiatives (Diaz, 2019). This correlation points to the existence of a pervasive form of 'digital frisking' that exceeds the boundaries of physical police stop-and-frisk activities (Diaz, 2019). Digital frisking extends the effects of policing tactics, such as stop-and-frisk, beyond the singular stop-and-frisk incident itself, as communities are constantly intercepted by the NYPD's surveillance machine (Cornebise, 2022).

This poster presents the findings from community engaged participatory action research methods of an organized series of teach-ins in June - July 2025 with Brooklyn Public Library (BPL). These teach-ins will discuss the existence of the technologies and practices of digital frisking with people who live in neighborhoods with majority Black and Brown residents in Brooklyn, New York. These sessions, produced with BPL aim to share reliable, trustworthy information about the state of police surveillance in New York City neighborhoods with the people BPL serves, and share strategies of refusal and resistance to these surveillance tactics that could be used in peoples' everyday lives. The information sessions are accompanied by short surveys for teach-in attendees to fill out about the efficacy of these events in helping them understand and discuss the state of police surveillance in their neighborhoods, and what they might do about it.

BACKGROUND
Information fields have addressed the question of surveillance as a mechanism for social control (Brown and Veinot, 2021) by articulating in several venues how surveillance exists shapes how people engage information (Buchanen and Husain, 2022) as well as their everyday lives (Newell and Randall, 2020) work (Stark and Stanhaus and Anthony, 2020), and education (Jones et al, 2020). This work takes a critical stance on surveillance in lived environments as it pervades the lives of already minoritized subjects who never consented to surveillance practices, and who are targeted by police through these lived environment surveillance apparatuses like smart city sensors and cameras (Kashef and Visvizi and Troisi, 2021). The ability for technologies to monitor, track, report, and make recommendations or predictions about people's lives presents a type of social control that can be – and is – resisted and even refused. Sharing these tactics of refusal and resistance to surveillance technology constitutes a form of information activism, whether practitioners see it that way or not.

Information Activism
Information fields, especially systems design, often suggest some concept of introducing some social good through the construction or use of data or technologies (Vasquez and Oltmann, 2023). Information activism is most often evoked in critical data studies literature as pointing to the utility of collecting data to make arguments for social change, or collectively working with data as a mode of community organizing (Disalvo, 2019). But, as scholars of information have noted, by and large data and technology will never be useful in producing meaningful structural

change (Crooks and Currie, 2020). This study, on the other hand does not hope to intervene in developing technological or data-based tools to resist the structural inequity extended through smart city technology, but rather to have simple organizing conversations with people in much the same way that Paris and Costley-White (2023) did for Covid-19 community dialogs, but here the discussions will be engaging surveillance technologies as they affect community members' everyday lives, and draw together their experiences on how to resist the carceral tendencies of these technologies.

METHODOLOGY

The researcher is an expert on surveillance in local NYC communities as they work with the Surveillance Resistance Lab of NYC working to abolish smart city surveillance practices around NYC. In addition, the researcher already works at the BPL and is participating in the informational events that the researcher co-organized with the BPL as a community surveillance expert, along with other experts from the Surveillance Resistance Lab. The researcher is conducting this research and analysis as an engaged community member.

Community engaged participatory action research is one type of transformative research method (Mertens, 1998) that is more legible to information fields (Lu, 2023) and (Paris and Costley-White 2023). These teach-ins represent a transformative intervention that at once is focused on fact-finding and communicating. These teach-ins led by the researcher and other community organizers who will lead community members to understand and articulate what surveillance infrastructure is deployed in respondents' communities, what types of concerns the respondents have about surveillance, as well as practices and tools for combating surveillance. These teach- ins will be hosted three times via Zoom in the months of June - July 2025, and will be hosted through the BPL. There will be an optional online survey at the end of the teach-in modeled on Paris and Costley-White's (2023) intervention with Covid-19 information sessions. The survey will help researchers understand the efficacy of this intervention.

DATA COLLECTION

At the end of the teach-in an optional survey will be circulated to reflect on the value of the teach-in that asks people to provide anonymous answers for 15 likert scale, multiple choice, and open-ended questions. The questions will be in the following categories: what they learned about surveillance in their community, their use of tools and practices for online and physical security, how much they trust various sources for information about local surveillance and how trustworthy they saw the event, and what they are likely to do based on the event, ranging from small personal practice changes to broader organizing plans they may have.

DATA ANALYSIS AND FINDINGS

From being involved with the BPL, the Surveillance Resistance Lab, and being a resident of the communities targeted by this surveillance, I envision the findings to follow what Paris and Costley-White (2023) found with similar town hall events around Covid-19 being helpful in navigating public health concerns. For the poster, I will provide statistical breakdowns of likert-scale survey questions as graphs and charts. As I do this I will be attuned to concepts of power, structural inequality, trust, and building coalitions to resist surveillance, like the type of informational activism focused on justice Paris and Costley-White (2023) found in their study. While I will include easily-represented statistical findings from surveys in the poster, there are also open-ended questions. I suspect there will be some compelling quotes that will illustrate the thematic areas mentioned above, as well as new ones that may emerge. I will organize these quotes along with the thematic areas they represent in a visually compelling way in the poster layout.

CONCLUSION

This study will likely suggest that as people are increasingly highly targeted by the economic interests of the carceral state, if not the carceral state itself, so too must be tactics to address this targeting. I suspect that this localized informational intervention that is contextualized, situated, and responsive to the community will show the power and utility of building out social, technical, and communicative infrastructures for informational activism against surveillance and carceral overreach in communities.

GENERATIVE AI USE

I confirm that I did not use generative AI tools/services to author this submission.

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Assessing the Effectiveness of UI/UX Design in Open Government Data Portal

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ABSTRACT
The ability of the public to access and use an Open Government Data Portal (OGDP) is essential for unlocking the potential of Open Government Data (OGD). Through OGDP, the government facilitates public access to its data and, at the same time, supports broader open government initiatives. The accessibility and usability of OGDPs remain critical, as they enable the public to engage with and derive value from OGD. To deepen understanding of these aspects, this study assesses the effectiveness of the OGDP user interface (UI) and user experience (UX) design through an evaluation of the Satu Data Indonesia (SDI) portal, the Indonesian national OGDP. The study involves ten participants in a 30-minute session using the SDI portal to complete three tasks, followed by a survey. The findings indicate that most participants experienced difficulties in searching for datasets, which negatively affected their willingness to use the SDI portal in the future.

KEYWORDS
open government data; open government data portal; Satu Data Indonesia; user interface; user experience; UI/UX.

INTRODUCTION
Opening government data to the public is a key government initiative to promote engagement with the public. Governments promote open government initiatives by distributing their data through Open Government Data Portals (OGDPs), which represent implementing open government initiatives and digitizing government data dissemination using information and communication technologies (Sari et al., 2024). Almost two decades after the first OGDP initiation, the existing literature on the accessibility and usability of OGDP primarily focused on developed countries and overlooked emerging countries. To fill this literature gap in emerging countries, we have chosen the Satu Data Indonesia (SDI) portal, the Indonesian national OGDP, for our case study to illustrate the situations in emerging Southeast Asian countries. The two research questions guiding this study are as follows: RQ#1: How is the user experience of accessing and searching for OGD datasets on the SDI portal? RQ#2: To what extent does the user experience of accessing and searching for OGD datasets influence the willingness to use the SDI portal?

LITERATURE REVIEW
Open Government Data Portal Adoption and Usability
Since the first initiation of OGDP by the United States in 2009, the other developed countries in North America and Europe started similar initiatives one after another, including Canada, the Netherlands, the United Kingdom, Switzerland, and Germany among others. The existing study shows the adoption of the OGDPs in different continents, including America (Begany et al., 2021; Máchová et al., 2018; Mutambik et al., 2021; Nikiforova, & McBride, 2021; Oliveira et al., 2016; Paige & Freund, 2019), Asia (Máchová et al., 2018; Molodtsov & Nikiforova, 2024; Mutambik et al., 2021; Nikiforova, & McBride, 2021; Saxena, 2019; Shao et al., 2021; Wang et al., 2023; Warraich & Rasool, 2023), and Europe (de Juana-Espinosa & Luján-Mora, 2019; Kapoor et al., 2015; Máchová et al., 2018; Molodtsov & Nikiforova, 2024; Mutambik et al., 2021; Nikiforova, & McBride, 2021).

Satu Data Indonesia
In June 2019, the President of the Republic of Indonesia issued Presidential Regulation Number 39 of 2019 on Satu Data Indonesia, which mandates Indonesian government agencies to produce up-to-date, accurate, and accountable data through SDI. The SDI Portal, accessible at https://data.go.id/, is managed by the One Data Indonesia Secretariat, the Ministry of National Development Planning. Since the ratification of SDI Presidential Regulation, Indonesian government agencies at distinct levels have started disseminating their data through their OGDPs (Sari, 2020).

The Unified Theory of Acceptance and Use of Technology Model
A study by Sari & Gasco-Hernandez (2024) shows that the individuals' behavioral intention to use technology may influence the use of OGD. This study assesses the user experience factor influencing users' behavioral intentions to use the OGDP. As a technological platform, we apply the Unified Theory of Acceptance and Use of Technology (UTAUT) model to inform our research. The UTAUT model focuses on four key determinants: effort expectancy, facilitating conditions, performance expectancy, and social influence, which influence people's behavioral intention to adopt the technology (Venkatesh et al., 2003).

METHODS

This study employs mixed methods, encompassing qualitative and quantitative approaches. It includes a 30-minute Zoom session in which participants searched for OGD datasets on the SDI portal while two researchers observed their interactions with the OGDP, followed by a survey based on UTAUT model. Ten Indonesian students were recruited from colleges across the U.S. in May 2025.

Observation

In the session, the participants were introduced to a scenario in which they acted as researchers who were searching for OGD datasets to support their research. They were requested to follow the instructions and complete three tasks given (see Figure 1). A think-aloud protocol and screen recording were employed to capture and analyze participants' interactions with the SDI portal interface.

Survey

The survey includes 25 questions divided into five sections: demographics (age, educational background, gender, and year of experience using OGDP), effort expectancy, facilitating conditions, performance expectancy, and social influence (see Figure 1). The survey questions aim to assess participants' level of agreement with the statements with a 4-point Likert scale, including strongly agree, agree, disagree, and strongly disagree.

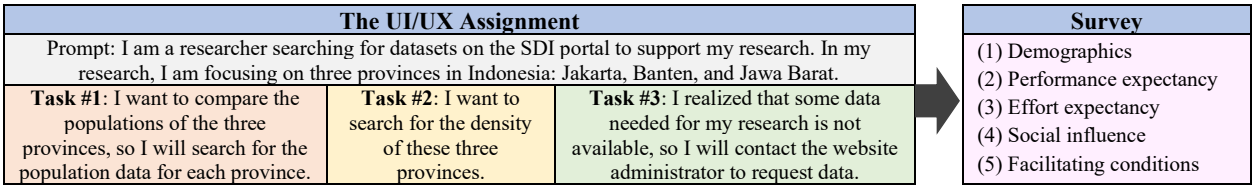

Figure 1. Research Design (Adapted from Sari et al., 2025)

RESULT AND DISCUSSION

This study demonstrates that none of the participants were able to fully finish the first two tasks due to difficulties in searching for the datasets. In the first task, no participant successfully found all the population datasets for the three provinces. Six participants were unable to find the datasets and were requested to skip and proceed to the second task. The participants spent two to eleven minutes on the first task before deciding to move on to the second one. Similarly, in the second task, none of the participants were able to locate the datasets, prompting them to request to move on to the final task. Six participants specifically mentioned that, since they could not find the population data in the first task, they were unable to calculate population density in the second task. Most participants discontinued their searches due to the excessive amount of time required to locate the necessary data requested in the assignment. These findings align with Kapoor and colleagues (2015), who assert that the easier the OGDP is to use and manage, the faster it may be adopted, as indicated by the time needed to locate datasets. Finally, all participants successfully completed the third task, as the contact information for the website administrator was provided at the bottom of the SDI portal, making it easily accessible.

Most participants use a keyword search feature to find data. However, since most participants encountered challenges searching for the datasets through the SDI portal, they suggested that the government should facilitate the search and filtering functionalities to enhance dataset discoverability. This finding aligns with existing studies, which emphasize the importance of search and filter capabilities in OGDPs for enhancing dataset discoverability, as the lack of such capabilities will hinder potential users from finding relevant OGD datasets (Máchová et al., 2018; Oliveira et al., 2016). Based on this experiment, we address our initial research question by concluding that the SDI portal is difficult to navigate and fails to provide access to necessary datasets, hindering participants' ability to complete their tasks. The results also address our second research question: the difficulty in accessing the SDI portal negatively influences their willingness to utilize it in the future. These findings are consistent with prior studies showing that a user's intention to use an OGDP is determined by its perceived ease of use and utility. This indicates that users are more likely to engage with OGDPs that are beneficial and user-friendly (Shao et al., 2021).

CONCLUSION

This research enhances the understanding of OGDP usability, and the challenges users face in accessing OGD. It highlights that poor usability reduces the willingness to use OGDPs. The findings also demonstrate that effective search and filtering functionalities of an OGDP improve dataset discoverability, thereby increasing its overall usability. Additionally, this study contributes to the growing body of research on OGDPs within the context of developing countries, an area that has been overlooked by most prior studies. Ultimately, the results may serve as a guide for governmental entities aiming to improve OGDP usability and promote greater utilization of OGD. The next phase of this study will enlarge the sample size with diverse backgrounds and include two more OGDPs of Indonesian provincial and local governments as the materials to verify the findings of this study. Finally, a

qualitative analysis of participants' interactions with the OGDPs will be conducted from the perspective of information-seeking behavior.

AUTHOR ATTRIBUTION

First author: conceptualization, funding acquisition, methodology, project administration, writing – original draft; Second author: funding acquisition, supervision, validation, writing - review and editing; Third author: resources, validation, writing - review and editing; Fourth author: supervision, writing - review and editing.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

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Semantic Organization and Analysis of Ancient Chinese Poets' Biographies: A Multi-Dimensional Perspective

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ABSTRACT

This study employs semantic web technologies and linked data to represent the biographical knowledge of ancient Chinese poets. It first constructs an event-centered poet ontology, encompassing (1) basic biographical information, (2) dynamic life events, and (3) evaluative discourse. Particular emphasis is placed on leveraging linked data to establish connections between poetic works and life events, thereby enriching the works with spatiotemporal context. Taking the poets *Li Bai* and *Du Fu* as case studies, the research utilizes a constructed biographical knowledge graph, combined with GIS, visualization techniques, and social network analysis, to explore multidimensional portraits of the poets, including their life trajectories, social networks, and stylistic features across different periods.

KEYWORDS

biographical ontology, biographical knowledge graph, poet's portrait, works evolution, biographical visualization

INTRODUCTION

Biography is a foundational method in historical and humanistic research, and has been revitalized in the digital humanities through technologies such as the semantic web, linked data, and knowledge graphs. Ancient Chinese poets have left behind abundant biographical records and literary works that embody rich historical and emotional value. However, existing biographical data is often fragmented, lacks semantic integration, and rarely connects life events with works, spatiotemporal context, or subjective evaluations. This limits comprehensive understanding and cross-domain reuse of such knowledge.

To address this, we propose an event-centered biographical ontology tailored to ancient Chinese poets, integrating their life events, works, relationships, and evaluative information. We construct a semantic knowledge graph and apply GIS, social network analysis, and sentiment analysis techniques to generate multi-dimensional portraits of poets such as Li Bai and Du Fu.

METHODS

Chinese poets (Biography Ontology of Ancient Chinese Poets, pbo), drawing on CIDOC CRM(CIDOC 2000) and BIO(Davis and Galbraith, 2011), models. The ontology structure includes (as in Figure 1): (1) Basic Information: Describes static metadata such as name, dynasty, courtesy name, and native place using extended FOAF and Schema.org properties. (2) Dynamic Life Events: Models a poet's life as a sequence of spatiotemporal events in five categories—Education, Politics, Creation, Life, and Move—linking people, places, and roles. Each event is annotated with time, place, participant roles, and source texts. (3) Subjective Evaluation: Integrates evaluative information (praise, criticism, sympathy) based on reception theory and modeled via the SEM framework to reflect how poets were perceived historically.

The model links poems to life events, emotional expressions, and spatiotemporal contexts, facilitating a multi-dimensional representation and analysis of poets' lives.

IMPLEMENTATION & RESULTS

We constructed biographical knowledge graphs(BKGs) for Li Bai and Du Fu by extracting data from biographies(Li, 2017, Feng, 2014), poetry collections(Peng, 1960), and structured databases(Chen, 2009, https://www.gushiwen.cn/). Life periods were segmented based on role-changing events. Entities such as people, places, times, works, and relationships were identified using rule-based and NLP techniques. Emotional tendencies were analyzed via fine-tuned classical Chinese models (SikuBERT), and all data were stored as RDF triples in Neo4j.

Based on the constructed KGs, we applied digital humanities methods to conduct multi-dimensional visualization and analysis(the visualizations are shown in Figure 2): **(1)Spatiotemporal Portraits:** Li Bai's route was scattered, spanning from Sichuan(*四川*) to Chang'an(*长安*), Luoyang(*洛阳*), Huainan(*淮南*), the Jiangnan region(*江南一带*), and finally Dangtu(*当涂*), where he died. Du Fu's path was more linear, moving from Luoyang(*洛阳*), Chang'an(*长*

安), Huazhou(华州), and finally drifting through the southwest(西南) until his death in Yueyang(岳阳). **(2)Social Networks**: Li-Du had extensive and distinct social networks.Li Bai's connections spanned officials, poets, and Daoists. Early period: close ties with officials, Later periods: associated with monks and recluses; Du Fu's network was more concentrated within the official class. **(3)Emotional Evolution:** Li Bai's poetry exhibits a dynamic emotional evolution across four life stages, generally characterized by a tone of romantic optimism with undercurrents of frustration. Early poems express ambition and love for nature ("青云", "春风"). Mid-life works reflect both political aspiration and frustration ("空", "醉"). Later poems feature retreat and Daoist themes, mixed with sorrow. The final stage shows a rise in negative emotion during exile ("愁", "蹉跎"). Du Fu's poetry presents a progressive deepening of emotional sorrow, strongly tied to historical events and personal hardship.Early poems are bright and scenic ("山", "清"). In Chang'an, tone turns bitter due to career failure ("难", "独"). During war, themes of suffering and death dominate ("苦", "泪", "干戈"). Late poems mix sadness with moments of peace in nature ("幽", "春").

Tables & Figures

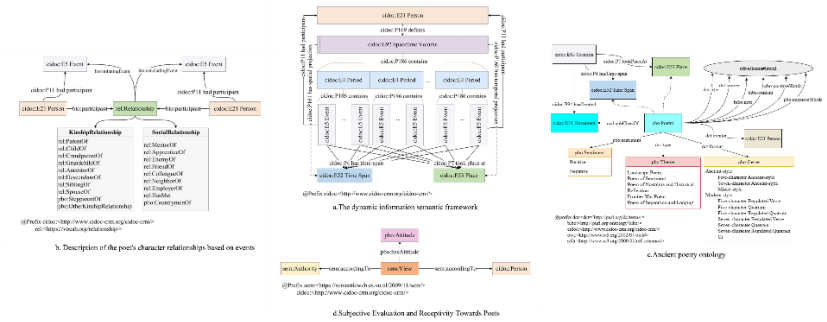

Figure 1. The ontology structure of the Biography Ontology of Ancient Chinese Poets

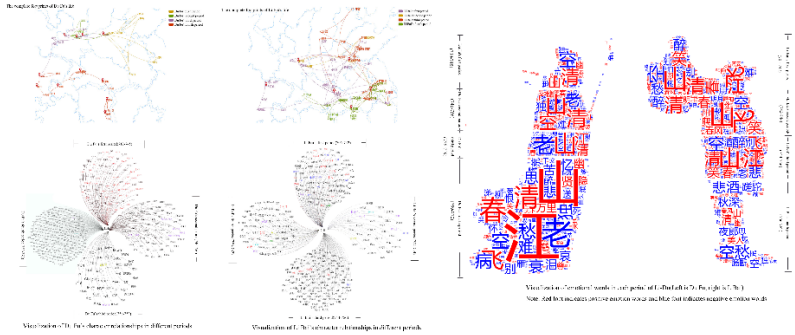

Figure 2. Integrated Visual Analysis of Li-Du's Lives: Space-Time, Social Network, and Emotion

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Shen, Xueying: conceptualization, methodology, visualization, writing-original draft; Lin, Litao and Wang, Yizhen: data curation, writing - review and editing; Ou, Shiyan: supervision, writing – review and editing.

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University Students' Use and Assessment of Chatbots as an Information Resource: An Exploratory Study

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ABSTRACT
The widespread use of AI chatbots has incited concerns about how chatbots will impact university students. In this work, we examine how students use chatbots as an information resource in their day-to-day lives. We present findings from an exploratory survey of 199 university students on their use and assessment of chatbots as an information resource for a variety of domains. Our findings reveal that university students make few distinctions between chatbots and search engines as information resources for most topics. We discuss the implications of our findings for future education and research directions.

KEYWORDS
chatbots, human-ai interaction, technology adoption, information behavior, university students

INTRODUCTION
A recent report by OpenAI stated that over a third of college-aged US residents use ChatGPT and about a quarter of their messages are related to learning or schoolwork (OpenAI, 2025). Research has examined how chatbots can positively impact higher-education students by supplying feedback (Ngo, 2023), delivering learning plans (Fuchs, 2023), and enhancing learning outcomes (Wu & Yu, 2024). Yet, fears also abound that chatbots facilitate student cheating (Cotton et al., 2024), decrease critical thinking and problem-solving skills (Sallam et al., 2023), and deliver misinformation (Yigci et al., 2025). Recent work at ASIS&T has increased our understanding of how university students perceive chatbots and their output with a paper on college students' credibility assessment of information generated by ChatGPT for academic tasks (Choi et al., 2025) and a poster on the metaphors college students use to describe ChatGPT (An et al., 2024). This poster builds on this work by presenting findings from a survey that investigated what types of information university students use chatbots for in their daily lives.

RESEARCH METHODS
We conducted an online survey, approved by Drexel's Institutional Review Board (IRB), through Qualtrics that asked university students about their information-seeking preferences toward a variety of topics using both chatbots, and as a comparison point, search engines, due to their commonplace use as a tool to seek information (Bianchi, 2024). (The topic list was adapted from a prior study on search behavior (Forte et al., 2014)). Participants had to be university students, at least 18 years old, and used an AI chatbot before. After survey completion, participants could enter a drawing for one of three $100 Amazon gift cards. The first author recruited participants via social media channels. After data cleaning, there were 199 participants (90 women, 108 men, 1 undisclosed gender; 148 aged 18-29, 38 aged 30-49, 3 aged 50+; 146 in associates/undergraduate programs, 53 graduate students; 86 majoring in Computer/Information Science, 50 in Social Sciences/Humanities, 20 in Engineering, 11 in Business/Economics, 11 in Natural/Physical Sciences, and 21 with Other/No major). All surveys were completed in August 2023. We used R to perform chi-square tests to compare frequencies between responses for search engine and chatbot behavior. We analyzed open-ended question responses using a thematic inductive approach (Braun & Clarke, 2006).

FINDINGS
A high percentage of participants reported that they *have* or *would search* for all of the types of information they were asked about using either a search engine or a chatbot (Table 1). Additionally, chi-square tests revealed no statistically significant differences between search engine and chatbot search behavior for any of the information domains between the three choices *have searched*, *would search*, or *would not search* ($p < 0.05$). To gain insight into the reasons for participants' search preferences, we included an open-ended prompt to write in one sentence what the most important thing is to know about how a chatbot works. A large proportion of the responses (72.36%) gave technical explanations of chatbot architecture. For example, some responses noted that chatbots use natural language processing (NLP) for conversation management or use machine learning (ML) algorithms to generate responses. Many of the technical replies were submitted by students with a Computer/Information Science or Engineering major. Fifty-five of the replies (27.63%) were categorized as non-technical descriptions and were categorized into dominant themes (Table 2). The most common answers referred to chatbots' interactive qualities (e.g., "responds to questions posed to it in natural language as if it were a real person."), their ability to substitute for human support (e.g., "Improving people's production capacity and reducing costs") and facilitation of research/writing (e.g., "can help 4 hours writing to be 2 minutes to 5 minutes work.").

Topic	Have searched		Would search		Would not search	
	SE	AI	SE	AI	SE	AI
Fitness	56.78%	56.78%	39.7%	35.2%	3.52%	8.0%
Medical treatments	58.79%	61.81%	34.2%	30.2%	7.04%	8.0%
Mental health	56.28%	52.26%	32.2%	38.2%	11.56%	9.5%
Personal finances	45.73%	45.23%	41.2%	40.2%	13.07%	14.6%
Politics	44.22%	37.19%	42.7%	46.2%	13.07%	16.6%
Sexual practices	40.70%	35.68%	40.7%	46.7%	18.59%	17.6%
Educational opportunities	56.28%	49.75%	32.2%	32.2%	11.56%	18.1%
Job responsibilities	56.78%	46.73%	32.2%	40.2%	11.06%	13.1%
Family relationships	50.25%	47.24%	36.2%	37.7%	8.04%	15.1%
Product reviews	54.77%	50.75%	37.2%	36.2%	13.57%	13.1%
Travel planning	54.77%	53.27%	31.7%	36.2%	13.57%	10.6%
Legal advice	49.25%	45.73%	35.7%	42.2%	15.08%	12.1%
Home and garden	43.72%	42.21%	42.2%	44.7%	14.07%	13.1%

Table 1. Percentage of survey participants' answers about searching for a topic with a search engine (SE) or an AI chatbot (AI) (N=199)

Themes	Count	Description
Interactivity	20	Refers to the ability of the chatbot to converse or an overall positive user experience
Substitution for human support	7	Refers to the provision of immediate service or support to ease human strain and increase productivity
Facilitation of research/writing	7	Refers to the ability of the chatbot to expedite information retrieval and/or writing
Accuracy	5	Refers to the ability to supply accurate information
Ethics	2	Refers to consideration of ethical or data privacy issues
Unsure/Don't know	3	Refers to responses expressing uncertainty
Other	11	Refers to unrelated, unique responses

Table 2. What are the most important things to know about chatbots? Count of Nontechnical themes in participant responses. Each response can include more than one theme. (N=55)

DISCUSSION

In our survey data, there was no statistical difference between college students' reported search behaviors and goals in using search engines and AI chatbots for any of the survey topics. We anticipated there would be significant differences between domains that could help tease out students' beliefs about the relative advantages or disadvantages of chatbots as an information resource. For example, we expected that participants might be less likely to use a chatbot for medical information because they would prefer to find a trusted healthcare-related resource among search engine results or for topics such as personal finances, when the query might contain personal and sensitive information. However, the results for these topics did not significantly differ for search engine and chatbot search behavior. When asked what was most important to know about how AI chatbots work, many students (particularly those pursuing more technical areas of study) provided detailed technical answers that highlighted aspects of LLMs like data harvesting or neural networks. Largely absent from both the technical and non-technical survey responses was the inclusion of several aspects of chatbot functionality that may cause it to not be an ideal information source for some subjects; for example, the need for chatbots to be trained on large datasets might lead to the provision of out-of-date and inaccurate legal advice. This finding highlights a need for education across disciplines in higher education on not only how AI chatbots work but on their strengths and weaknesses as an information resource. Many of the nontechnical responses championed the ability of chatbots to converse and provide an overall good user experience; similar qualities have surfaced as valued in recent work with university students (Park & Ahn, 2024) and perhaps impacted participants' view of AI chatbots as an all-purpose tool. More research could also be done on how chatbots' perceived convivial personalities affect information assessment in human-AI interaction.

LIMITATIONS

Our survey utilized a nonprobabilistic sampling strategy and therefore was not representative of the university student population. Additionally, nationality was not a data point collected in the survey. Therefore, there may be some variations between university students with different nationalities in their perceptions of chatbots that were not accounted for.

GENERATIVE AI USE

We confirm that we did not use generative AI tools or services to author this submission.

AUTHOR ATTRIBUTION

First author: Data curation; Formal analysis, Investigation, Methodology, Project administration, Writing – original draft. Second author: Conceptualization, Methodology, Supervision, Writing – review & editing.

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Trustworthy AI: How Much Does the Public Care?

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ABSTRACT

While institutions have developed Trustworthy AI (TAI) frameworks, less is known about whether the public indeed finds TAI factors important to increasing their generative AI (GAI) usage, and how TAI and other usage motivators relate to GAI usage types and perceived GAI risks. Surveying 322 U.S. adults, this study found Technical Robustness and Safety to be the top TAI factor, though it was second overall (after Effort Expectancy). Multiple Correspondence Analysis (MCA) found notable groupings. For example, infrequent GAI usage was related to preferring the Privacy and Data Governance TAI. Respondents who perceived GAI as lower risk preferred the Societal and Environmental Well-being TAI, Performance Expectancy, and Facilitating Conditions motivators.

KEYWORDS

Generative AI; Informative behavior; Usage motivators; Trustworthy AI

INTRODUCTION

Generative artificial intelligence (GAI) has raised considerable excitement for its potential. However, multiple concerns hinder usage, including issues with accuracy, biases, over-reliance, and lack of human oversight (Thomson Reuters Institute, 2025). In response, the notion of Trustworthy AI (TAI) has been highlighted. This includes research on the public's assessment of the trustworthiness of specific AI applications (Dlugatch et al., 2023; Ng & Zhang, 2025) and governance frameworks for TAI to enhance reliability, transparency, fairness, and oversight (Kaur et al., 2023). A prominent example is the European Commission's (2019) *Ethics Guidelines for Trustworthy AI* (EGTAI), which has raised significant governance and philosophical discussion (McCormack & Bendechache, 2024; Stamboliev & Christiaens, 2025). Researchers have found, however, that less is known about how individuals react to TAI frameworks, which is beginning to be addressed by studies on specific groups (e.g., AI practitioners; Baldassarre et al., 2024). Studies of how the public responds to these TAI frameworks are still rare.

Focusing on GAI (e.g., ChatGPT, Copilot, Gemini), which is more widely available to the public, this exploratory study surveyed adults in the U.S. to explore two research questions (RQs): RQ1: (a) Are individuals motivated by the TAI factors to increase their usage of GAI? and (b) how do TAI factors compare among themselves and to other motivating factors? RQ2: Do the preferences for TAI and other motivation factors vary with GAI usage types and risk assessment of GAI? Findings on the above could enhance our understanding of how the public responds to proposals on TAI and identify facilitating/prohibiting factors for AI design and training.

RESEARCH MODEL AND METHODS

The study focused on 11 usage motivators (Table 1), built on (a) seven TAI requirements from the European Commission's (2019) EGTAI, for its prominence among the TAI guidelines and (b) four key constructs of the Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al., 2003), for its frequent usage in research on AI adoption (e.g., Baig & Yadegaridehkordi, 2025). The survey question was, "If GAI has the following characteristics, how much would it increase your usage of GAI?" (1: *No increase at all* to 5: *Very large increase*). In addition, following information behavior (IB) research's user-centered paradigm and attention to individual and contextual differences (Dervin & Nilan, 1986; Vakkari et al., 1997), this study posited that usage motivators are not one-size-fits-all. IB can vary with types of usage and perception of risks about the information source (e.g., Kim et al., 2021; Lim & Kwon, 2010). RQ2 thus investigated how the usage motivators may vary with an individual's AI perception and use. The operationalization of GAI usage (7 types) and assessment of GAI risks (5 risks) were adapted from Christensen et al. (2024). These usage (USE) and risk (RISK) categories are shown in Figure 1.

Data were collected from U.S. adults in Spring 2025 using an online questionnaire. The study obtained University IRB approval and recruited participants from the Conjointly Company's survey panels. Descriptive statistics and within-subjects pairwise comparisons (paired sample t-tests, with Holm adjustment to account for multiple comparisons) were conducted for RQ1. Multiple Correspondence Analysis (MCA) was used for RQ2. MCA is an exploratory analysis technique that visualizes the relationships of two or more categorical variables. The usage motivators in Figure 1 show the motivator ranked highest by each respondent. Other variables were dichotomized into High (H) or Low (L) based on median scores. Supplementary variables (demographics) were also visualized. Analyses were conducted with R, including the ggstatsplot and FactoMineR packages (Le et al., 2008; Patil, 2021).

RESULTS

The study collected 322 responses. The gender composition was 52.5% women and 47.5% men. The age composition was 21-39 (35%), 40-59 (35%), and 60 or above (30%). About 66% were non-Hispanic White. Regarding GAI usage, the top three were "get answers," "get advice," and "solve problems." On assessment of GAI risks, the top three were "vulnerable to hacking/manipulation," "make erroneous predictions," and "make up

imaginary scenarios." Table 1 shows the RQ1 results. Among the seven TAI, the top three motivators were (1) Technical Robustness and Safety, (2) Human Agency and Oversight, and (3) Transparency. When UTAHT factors were included, the top three were (1) Effort Expectancy, (2) Technical Robustness and Safety, and (3) Performance Expectancy. The pairwise comparisons found six statistically significant differences (Technical–Privacy, Technical–Accountability, Effort–Social, Effort–Accountability, Performance–Social, and Performance–Accountability).

GAI Usage Motivators		Cronbach's α	*M*	*SD*
U2	Effort Expectancy (Effort) (e.g., "is easy to use")	.94	2.79	1.38
T2	Technical Robustness and Safety (Technical) (e.g., "has safeguards that enable a fallback plan in case of problems")	.95	2.76	1.27
U1	Performance Expectancy (Performance) (e.g., "is effective")	.95	2.75	1.29
T1	Human Agency and Oversight (e.g., "protects fundamental human rights")	.92	2.73	1.31
T4	Transparency (e.g., "is explainable, i.e., the system can explain its technical process and its decision")	.94	2.70	1.25
T6	Societal and Environmental Well-being (e.g., "is environmentally friendly")	.92	2.68	1.31
U4	Facilitating Conditions (e.g., "is inexpensive")	.94	2.67	1.23
T5	Diversity, Non-discrimination, & Fairness (e.g., "provides good accessibility to users with different preferences & abilities")	.88	2.66	1.24
T3	Privacy and Data Governance (e.g., "guarantees privacy and protects users' data")	.88	2.65	1.23
U3	Social Influence (Social) (e.g., "is used frequently by your friends and family")	.95	2.630	1.31
T7	Accountability (e.g., "provide accessible mechanisms to redress GAI's negative impacts")	.94	2.629	1.20

Table 1. Descriptive statistics: How much each factor would increase respondents' usage of GAI

Figure 1 shows the MCA results, where more related variables are mapped closer to each other (Friendly & Meyer, 2016). Starting from the top-left, infrequent and casual GAI usages and the 60+ age group were located. The closest related usage motivator was the Privacy and Data Governance TAI. Other motivators were UTAUT's Social Influence, TAI's Human Agency and Oversight, Technical Robustness and Safety, and Accountability. The top-right quadrant contains perceptions of high GAI risks. The closest motivator was the Transparency TAI. The bottom-right contains frequent and serious GAI usage, with Effort Expectancy and the Diversity, Non-discrimination, and Fairness TAI being more closely related. The bottom-left quadrant includes perceptions of lower GAI risks, with the Societal and Environmental Well-being TAI being the most related motivator. Also closely related to this group were two UTAUT motivators, Facilitating Conditions and Performance Expectancy.

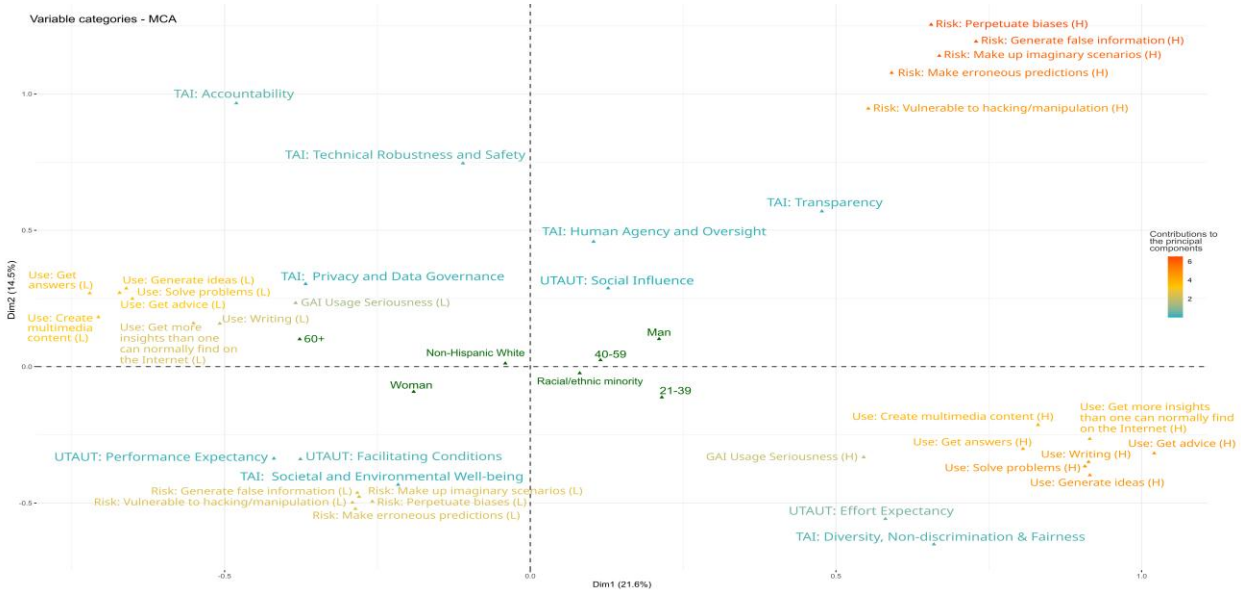

Figure 1. MCA biplot of usage motivators, GAI usage, GAI risk assessment, and demographics

DISCUSSION AND CONCLUSION

The study found that respondents do care about some TAI factors (e.g., Technical Robustness and Safety, Human Agency and Oversight). However, TAI factors ranked below Effort Expectancy. These have implications for GAI policy and design, suggesting efforts on TAI can make a difference in motivating GAI usage, though it is not the highest priority for the sample as a whole. As this is a cross-sectional study with a non-probability sample, future studies may verify whether the above pattern is prevalent in representative samples and track longitudinal changes. The exploratory MCA shows distinct variable groupings (e.g., infrequent/casual GAI use with the Privacy and Data Governance TAI as the main usage motivator, frequent/serious GAI use with Effort Expectancy, high GAI risk assessments with the Transparency TAI, etc.). This can contribute to GAI and TAI research, informing the development of hypotheses for further model development to investigate GAI usage types, risk assessment, and TAI usage motivators, as well as informing the development of customized strategies for encouraging GAI use.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Sin, Sei-Ching Joanna: conceptualization, formal analysis, funding acquisition, investigation, methodology, project administration, visualization, writing – original draft, writing – review and editing.

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An Indexed Account of Ephemeral Culture: Algorithmic Contexts of Memes

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ABSTRACT
This paper takes the initial steps for trying to define metadata that may curb some issues related to digital ephemera, such as context collapse and information decay. We attempt to show aspects of cultural context as related to how memes—each of which are collections of visual artifacts that carry a cultural idea—are indexed by Google Cloud Vision (GCV). Considering three meme collections that differentiate in their visual content's expression of an "idea," we contribute some exploratory metrics. These metrics attempt to account for locations of cultural ideas across web domains using Gini coefficients as a measure of distribution across web domains.

KEYWORDS
Memes, Digital Humanities, Digital Archeology, Digital Archives, Cultural Heritage Informatics

INTRODUCTION
Digital archival and archeological research is highly affected by ephemerality (Dym et al., 2023; Krapp, 2024). Ephemerality is relevant for cultural heritage and memory institutions because of the risk of information decay (Pfeffer et al., 2023) and context collapse (Brandtzaeg & Lüders, 2018; Pettis, 2021). The former is total information loss while the latter is akin to limited "aboutness" (Hauser & Tennis, 2019; Rondeau, 2014) when diversity is homogenized through a loss of context (de Fremery & Buckland, 2022). Prior research has studied these issues in relation to video games (Dym et al., 2023; Krapp, 2024) and formalized academic knowledge such as open data, references (da Silva, 2021; Klein et al., 2014; Lemaire et al., 2025). This poster uses particularly ephemeral media, called "memes," to understand these issues in a granular and computationally focused way.

The "meme" concept is underutilized in information studies (Smith et al., 2024). Yet, a meme is the cultural heritage of an idea or "mentifact" (Gnoli, 2018; Smith et al., 2025) spanning a plurality of artifacts. Thus, memes account for cultural granularity in evaluation, providing archival resilience towards ephemerality. While Hjørland warns us that Gnoli's meme requires connection to materiality (2018) and that "aboutness" lends itself to subjectivities that detract us from more objective subject headings in formal knowledge organization (2001), *memes are suggestive of a materially mediated way to test for when subjectivities of cultural aboutness could be relevant for formal knowledge organization* to consider. This poster is an initial step in using memetic granularity to understand relevant for testing dimensions of an existing knowledge organization's metadata at capturing context (de Fremery & Buckland, 2022).

METHODOLOGY
We borrow the methodology of our prior paper (Smith et al., 2025) that provides metrics indicative of "digital memory" within memetic artifacts curated on Know Your Meme (KYM), and gathering data about how they are contextualized on the web through Google Cloud Vision (GCV) API. GCV provides web indexing data for a given artifact and additional data about similar artifacts containing related visual data (Google, 2025). This poster attempts to capture a notion of memetic context and also explores the possibility that GCV, as an archival tool, may systematically misunderstand some aspects of culture by looking at three different meme collections: Doge, Hello There, and Loss. Example artifacts of each can be seen in respective order in Figure 1 below:

Figure 1. These are example artifacts from each meme collection, Doge, Hello There, and Loss respectively

These were chosen as the visual data required to understand each meme collection are intuitively different. *Doge* is typically an iconographic Shiba Inu dog. *Hello There* is a meme based on character dialogue in Star Wars between

Kenobi saying, “Hello There” and General Grievous responding, “General Kenobi!” while juggling a large number of Star Wars related references in contrast to Doge’s iconic ubiquity. Finally, *Loss* is an abstract pattern: | || || |_.

These differences indicate our expectations of GCV’s web indexing data. GCV provides three kinds of indexing data that indicate the context of each meme. It offers (1) “full matching images” that are precise matches to the exact artifact provided, (2) “partial matching images” that might be croppings or other minor alterations of the original artifact, and (3) “visual similar images” that may share highly similar abstract geometry or more distantly connected patterns of an otherwise different artifact. We expected Doge and Hello There to have some more precise partial matchings, and the opposite for Loss because of its abstraction. Meanwhile, we expected Doge and Loss will have more visually geometric commonality because of the regularity of abstract patterns.

From these three sets of web indexes for each meme collection, we reduce each web location to its primary web domain. That is, if GCV provides the index for “https://64.media.tumblr.com/some/web/location/artifact.png” then we reduced that to “64.media.tumblr.com” and treated these locations as nodes that are connected through being a part of the same meme collection, the meme name being the central node that all the domains are connected to. Since we gathered all the artifacts from KYM, we removed any indexing data related to the site. From the strength value of each node, we calculate the Gini coefficient, as a measure of inequality in a distribution, ranging between 0 and 1, where 0 corresponds to perfect equality. In our networks, the Gini coefficient would be close to 0 if all the nodes in the network have the perfect equality, and close to 1 when there is a large disparity among the strengths. Even though each meme collection has a different number of nodes, we can still compare the Gini coefficients because it is a relative measure of inequality that is independent of the network’s size.

In interpreting our Gini coefficients in terms of context, we operationalize context as being more or less equitable as being culturally more or less “general.” That is, if the Gini is 0 for full matching, then that would mean that the idea that the meme collection represents shows up everywhere equally. If the Gini is 1, that means it only has one localized context online. The closer to 1 the Gini is, the more specialized the context of that culture is. So, if the Gini coefficient was .55, then this would imply that while the meme has touched on a lot of sites, it is slightly more isolated on the web than something that was .45 for example.

RESULTS & DISCUSSION

The results of the Gini coefficients for the network of web domains are reported in Table 1 below.

	Doge	Hello There	Loss
Full Matching	0.6394	0.5874	0.7665
Partial Matching	0.5897	0.6194	0.7311
Visually Similar	0.6895	0.7128	0.6524
Average Gini	0.6395	0.6398	0.7167

Table 1. The Gini coefficients of each meme collection’s web domain networks

Since these are metrics of inequality of web domains for those that are Fully Matching, Partially Matching, and Visually Similar indexings for each meme entry, we can provide some initial commentary on what these results say relative to our inspections of each meme and our expectations.

Doge is the most equitable on average for all related artifacts, which makes sense as a dog primarily used to emote on many websites. Hello There is most equitable in Full Matching of all the meme collections, but is more inequitable as GCV attempts to find related artifacts. This suggests that the collection of artifacts, when taken together, captures a context that is perhaps less understood through visual similar media. This is expected as there are many differences in visual data across Hello There’s artifact collection relative to Doge, for example. Loss is inequitable on average. In some ways this is expected as an aesthetically abstract pattern. However, notably, its inequality drops off with “visually similar” networks. This is also expected since what makes Loss unique is a geometric pattern that is less likely to show up in visually similar artifacts if GCV does not know how to computationally capture “ | || || |_” within relevant cultural contexts. Such a pattern might be difficult to see in arbitrary images with computer vision relative to more relevant vision data for typical Google image retrieval tasks.

CONCLUSION

By comparing our expectations of the meme collections, Gini coefficients suggest a way to see contexts that are comparable to how people might interpret or use the meme artifacts. More development and restructuring is required to understand the relationship across the Gini coefficients in more computational ways. These metrics could be compared across time to account for dynamics and rates of information decay. The current study considers a single day’s indexing despite the artifacts’ possible transmission. We plan to produce a more finely tuned web metric of context, relevance, and ephemeral risk related to cultural dynamics on the indexed web. Also future work will

consider whether there is qualitative value in considering how much of the Partial Matching and Visually Similar artifacts relate to the meme. We also could benefit from a more developed taxonomy of kinds of memes.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

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The Differing Perspectives of Health Information Providers on Credible Information Access by Country Income Levels

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ABSTRACT
This study presents preliminary findings on the perceptions of health information professionals regarding the importance of reliable healthcare information. This study analyzes 336 responses from health information professionals across 61 countries. The results reveal statistically significant differences in perceived needs for health literacy promotion and the enforcement of professional standards and ethics across different income levels of countries. These findings highlight the importance of tailoring equitable healthcare information policies to address global disparities.

KEYWORDS
Health information, information professionals' perceptions, information literacy, standards and ethics

INTRODUCTION
Access to reliable health information is increasingly recognized as a fundamental human right, essential for improving health outcomes and empowering individuals to make informed decisions. Yet, the landscape for health information access remains deeply uneven due to a range of factors, including socioeconomic status (Dahal & Aoun, 2023; Morey, 2007).

Health information professionals, such as medical librarians, play a critical role in bridging this gap by facilitating access to trustworthy health resources. They also manage sensitive information, which requires them to uphold high ethical standards to ensure the responsible treatment of health information. To effectively serve their communities while combating misinformation and navigating evolving ethical landscapes, health information professionals must be equipped with the necessary resources and literacy skills to address the diverse needs of the populations they support. However, disparities in access to digital tools and health information technologies affect the quality and effectiveness of their work (Gilmour, 2007; Ogunmodede et al., 2023). For instance, professionals in lower-income countries are often disadvantaged when it comes to staying informed about the latest medical advancements due to limited access to credible and evidence-based platforms like MEDLINE and other institutional databases (Weng et al., 2013). Given that information professionals and librarians are now becoming more involved in health literacy initiatives in contrast to their earlier (Ottosen et al., 2019), it is required for health information professionals to be equipped with the necessary literacy skills to meet the diverse needs of the population under their tutelage.

Despite the recognized importance of health information professionals' roles, there is a lack of empirical research that systematically examines how these professionals across different regions perceive their roles. This study addresses this gap by analyzing the survey responses of 351 health information professionals from 61 countries. Among the various influencing factors, this research focuses on country-level economic conditions, as financial constraints can significantly limit access to specialized training and professional development opportunities for health information workers (Anthony & Stablein, 2016). These limitations, in turn, shape professionals' perceptions of their responsibilities and the value of reliable health information resources (Schillinger, 2021). The findings contribute to the ongoing conversation about how public libraries can promote inclusive access to knowledge and cultural capital, particularly in underserved regions.

METHOD
We investigate whether there are statistically significant differences in health information professionals' perception in the importance of reliable healthcare information and needs for its literacy and ethics standards across income levels (i.e., High, upper-middle, lower-middle and low income) based on World Bank (WB) classifications. The survey data used in this were developed by the research team led by the nonprofit Healthcare Information For All (HIFA) and collected from August to November in 2023 from health information stakeholder groups, including medical workers, information professionals, and policymakers. Of those 2,410 completed responses from 135 countries, we focused on respondents from health information providers (N = 351) and excluded 15 respondents with missing data (4.3%), resulting in 336 complete cases. The general perception of the importance of access to reliable healthcare information was measured using the question "Access to reliable healthcare information is (or should be) a human right," rated on a five-point Likert scale ranging from 1 *(strongly disagree)* to 5 *(strongly*

agree). Needs were assessed using statements regarding the need for more support for health literacy, protection from misinformation, and higher ethical standards for information providers, also rated on 5-point Likert scales. Statistical comparisons were conducted using the Kruskal-Wallis test, with post-hoc Pairwise Mann-Whitney tests and Bonferroni correction for significant differences. Analyses were performed using Real Statistics 9.4 (Zaiontz, 2025), with p-values <0.05 considered significant.

RESULTS

The varying levels of emphasis on the perceived need for increased support for health literacy were observed based on WB income levels (χ^2= 3.31, p = .03, df = 3) as well as the need for higher standards of practice and ethics for information professionals (χ^2= 6.41, p < .05, df = 3). On the other hand, no significant differences were revealed in awareness of the importance of access to reliable health information across income levels (χ2= 3.23, p = .07, df = 3). These findings indicate a shared priority in access to reliable health information. See Table 1.

Among the four income groups, a significant difference was observed only between high-income and lower-middle-income groups (U = 4538.5, p = 0.01) concerning the perceived needs for increased support for health literacy. Regarding the perceived need for higher standards of practice and ethics for information professionals, a statistically significant difference was found exclusively between high-income and upper-middle-income groups (U = 3272.5, p = 0.03). See Table 2.

World Bank Income Levels		Sum of ranks				χ^2
		High Income	Upper Middle Income	Lower Middle Income	Low Income	
Importance of access		43106.5	5562.5	6254	1693	3.23
Needs for	Supporting health literacy	43284	5339	6368.5	1624.5	3.31*
	Protecting the public from misinformation	42738	5698.5	6549	1630.5	1.20
	Higher standards of practice and ethics	39999	6420.5	8063	2133.5	6.41*

*p<.05

Table 1. Information Professionals' Attitudes Towards Reliable Healthcare Information in Its Importance and Perceived Needs by World Bank Income Groups

World Bank Income Levels		Needs for supporting health literacy		Need for higher standards of practice and ethics	
		U	p	U	p
High Income	Upper Middle Income	3812	0.23	3272.5	0.03*
High Income	Lower Middle Income	4538.5	0.01*	4511	0.06
High Income	Low Income	1153.5	0.11	1090.5	0.20
Upper Middle Income	Lower Middle Income	649.5	0.39	688	0.77
Upper Middle Income	Low Income	166.5	0.57	179	0.94
Lower Middle Income	Low Income	234.5	0.97	233	0.93

*p<.05

Table 2. Pairwise Comparisons of Information Professionals' Attitudes Towards Reliable Healthcare Information: Perceived Needs Between World Bank Income Groups

CONCLUSION

Our work provides rare evidence-based insights into the variations in the perceptions of health information professionals across different income groups. While there is a shared recognition of the importance of access to reliable healthcare information across regions, differences emerge in the perceived urgency for professional development and ethical practice, particularly between high-income and lower- or upper-middle-income countries. This finding underscores disparities in perceived responsibility and capacity, which may reflect unequal resources and readiness to advance health information practices globally. This finding provides suggestions for policymaking and offers actionable insights for industry practitioners.

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Use of Eye Tracking as a Method for Health Information Seeking Behavior Research

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ABSTRACT
This paper analyzes 25 health information behavior studies published in the period of 15 years (2009-2023) using eye-tracking as the research methodology. Eye-tracking technology has become a valuable tool to study information behavior. This study examines the ways of adopting eye trackers in health information behavior research and how the research is designed with an extended method the technology provides. This paper contributes to understanding methodological trends for health information behavior research.

KEYWORDS
Health information behavior research; Eye tracker; Eye tracking; Research trends; Research methods

INTRODUCTION AND BACKGROUND
Eye trackers are increasingly used in many disciplines, including psychology, health science, and computer science, as adoption of eye movement analysis was encouraged for understanding users' behavior and their cognitive processes (Lund, 2016). Particularly, eye tracking can be a helpful tool for research in the information science field because of the eye-mind hypothesis, which argues that human attention is focused where the eyes are looking (Just & Carpenter, 1980). Eye tracking can also provide additional data for researchers to observe what users look at and how they consume information presented (Syn, 2023). For example, in information science field, eye tracking has been used to study reading behavior (Lund, 2016; Yoon & Syn, 2022), design websites and information systems (Lorigo et al., 2008; Rele & Duchowski, 2015), and understand users' interactions such as online searching (e.g., Kim et al., 2015) and social media (e.g., Barreto, 2013; Piao et al., 2013). Studying eye movements can also reveal new insights into the ways people use and interact specifically with health information. Gwizdka et al. (2019) suggest that eye tracking methods can be used to study online health information behavior "not observable with other methods (p. 746)" such as tracing consumer's viewing patterns on a screen to study which web page elements they use to evaluate health information quality, or measuring fixation duration and reading speed to analyze users' comprehension of information presented. Moreover, prior health information behavior studies adopted eye-tracking in investigating how users understand different types of health information (e.g., Fenko et al., 2018) and types of information formats such as images and text (e.g., Strasser et al., 2012). As there is an increased use of eye trackers in health information behavior research, it is critical to understand how the method is used to provide insights into potential adoption of the method for future research.

METHODS
Research articles using eye tracking techniques for their major methodology were collected from online databases including Academic Search Complete, Library, Information Science & Technology Abstracts (LISTA), ProQuest Research Library, and Web of Science. The search query used is ("eye tracking" OR "eye tracker" OR "gaze" OR "gaze tracking" OR "eye movement" OR "gaze movement") AND ("information seeking" OR "information seeking behavior" OR "information seeking behaviour"). The initial search returned 669 articles. Studies published in peer-reviewed journals written in English were selected, duplications were removed, and articles that did not use eye tracker or were not about health information behavior were removed. The final set used for analysis included 25 articles.

The articles were reviewed to understand trends for health information behavior research using eye trackers. Data on publication year, authors and authors' disciplines, research topics, types of methodologies, measurements, population, context, and use of theory and model were coded from the 25 articles for analysis. Based on the coding scheme, initial coding was done using a sample of articles to identify codes. With the initial codes, the authors reviewed and agreed on the codes.

FINDINGS
Publication Trends
The search was made from 2004 to 2023. From the 24 articles selected for analysis, the studies on health information behavior using eye trackers were identified to be published from 2009 to 2023. The number of publications increased consistently: 2 publications during 2009-2013, 9 publications during 2014-2018, and 14 publications during 2019-2023. While the journals selected for those publications varied widely, some major journals were Journal of Medical Internet Research, Applied Clinical Informatics, and Patient Education & Counseling.

It was found that the research on health information behavior using eye trackers tends to be collaborative as most articles involved more than 2 authors. Out of 25 articles, only 2 of them were written by single authors (8.0%), and 36.0% of the articles were written by 3 authors (9 articles). When the disciplines or expertise of the authors were observed, it was found that 20.3% of the authors were researchers in Information Science, followed by Communication (16.9%), and Heath or Medicine Studies (15.3%). Geographically, North American (45.2%) and European (29.0%) countries stand out to conduct research on health information behavior using eye trackers, the majority being the USA (43.8%).

From the articles, the most researched topic is, of course, information behavior (23 articles, 92.0%), followed by topics such as health studies (19, 76.0%), information retrieval (15, 60.0%), credibility (7, 28.0%), and information processing and decision making (4, 16.0%). The topics covered are major research topics in health information behavior and our findings show that similar topics are considered with eye tracker studies.

Methodological Trends

In terms of research design, it is found that research projects tend to use a mixed methods approach, adopting additional methods to eye tracking. No study was using a single method (only eye tracking). There were 8 articles using two methods (32.0%), 12 articles with three methods (48.0%), and 5 articles using five methods (20.0%). In addition to eye tracking, the most popularly used methods are experimental setting (task-based or scenario-based) (11 articles, 44.0%), surveys/questionnaire (10, 40.0%), interviews (8, 32.0%), video or sound recording (5, 20.0%), memory or recall test (4, 16.0%), think aloud (3, 12.0%), comprehensive test (3, 12.0%), etc. Additional qualitative methods are chosen because they can provide more insight into eye-tracking data through participant input, such as comprehension tests, log analysis, interviews, and focus groups. They are convenient for these studies as participants are already invited to conduct eye tracking research.

The number of participants varied widely. The common scope of study participants was 50-59, 20-29, 40-49, and 70-79 participants. Table 1 presents the distribution of count of articles by the number of research participants. It was found that the majority of research recruited participants in a college or university setting: college or university students (12 articles, 48.0%) and other college or university members such as staff or faculty (7, 28.0%). In many cases, the participants were asked to conduct an online or web search (15 articles).

Number of participants	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Count of articles	0	3	4	1	4	5	1	4	3

Table 1. Distribution of Articles by the Number of Study Participants

The types of measurements for data analysis used popularly include fixation duration (16 articles, 64.0%), fixation count (12, 48.0%), time spent on task completion (9, 36.0%), and gaze path (9, 36.0%). The majority of the articles indicated that Tobii eye trackers were used for their research (15 articles, 60.0%).

It was found that much health information behavior research that uses eye trackers tend not to apply a theory, model, or framework (9 articles, 33.3%). Some articles indicated that they were designed based on information seeking theories (7, 25.9%), theories related to source credibility (3, 11.1%), learning theories (2, 7.4%), information search behavior models (2, 7.4%), and HCI related theories (2, 7.4%).

DISCUSSION AND CONCLUSION

This study examined the use of eye trackers for health information behavior research in a 15-year timeframe (from 2009 to 2023). From 25 articles analyzed, it was shown that eye tracking continued to be adopted for health information behavior research since 2009, and that it became more popular in the last 5 years (2019-2023). Eye tracking studies tend to be collaborative involving multiple authors. Researchers of health information behavior using eye-tracking studies tend to come from North America and Europe for the most part, and the disciplines most represented are Information Science, Communication, and Health or Medicine Studies. Elements most studied using eye trackers in health information seeking behavior are information retrieval, credibility, and processing patterns. All of the research studies investigated in this paper adopted a mixed methods approach where other measurements are used in addition to eye-tracking. Study participants were most often recruited in college or university settings.

Eye tracking is an important emerging technology to study health information seeking behavior because it provides new data points and more direct measurements for studying this behavior. Eye tracking measurements can provide more context for qualitative research studies like interviews, focus groups, surveys, and screen logs by providing direct data as opposed to self-reported data. Response bias is very common in qualitative research methods that involve self-reporting like interviews, surveys, and questionnaires and even in observational studies. Users might alter their behavior or responses to “look good” to researchers, or they might be unable to properly describe or evaluate their own behavior due to lack of awareness or knowledge of measurements (Rosenman et al., 2011). Direct data collection, on the other hand, can offer more precise measurements and eliminate or reduce response bias

(Prince et al., 2008). Moreover, when eye-tracking is used in mixed methods studies, the data collected can offer an additional perspective and validate findings derived from qualitative methods, making for a more dynamic research design.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

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Bringing Archives to Life: Designing an AI Module for Dynamic VR Experiences from Archival Photographs

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ABSTRACT

This paper presents a design-focused approach to creating an AI-enhanced module that transforms archival photographs into dynamic virtual reality (VR) experiences. The project addresses the need for immersive access to cultural heritage while avoiding premature claims about historical accuracy. The Arizona Historical Society (AHS) serves as a testbed due to its metadata-rich photographic collection, institutional scale, and proximity. The system integrates open-source AI tools for depth estimation and mesh generation, guided by structured archival metadata. A participatory design methodology involving archivists, historians, users, and UX designers and AI developers informs ethical parameters and usability considerations. As a work in progress, the project contributes a replicable framework for heritage institutions interested in developing responsible, metadata-driven immersive systems grounded in archival values.

KEYWORDS

AI; virtual reality; participatory design; cultural heritage; archival photographs

INTRODUCTION

As cultural heritage institutions increasingly explore immersive technologies to enhance engagement and access, they face two major technical and ethical questions: (1) how to generate immersive environments from limited archival imagery, and (2) how to ensure that any AI-generated representations remain ethically and historically responsible. This project chooses to focus on the former—system design—prioritizing usability and institutional feasibility over speculative validation of historical accuracy.

To support this effort, the Arizona Historical Society (AHS) was selected as the pilot site. AHS is a medium-sized regional archive located in Tucson, Arizona, with extensive photographic holdings and robust metadata practices, making it well-suited for a metadata-driven design prototype. The project explores how to convert high-resolution, verified 2D photographs into immersive 3D scenes using AI-based depth estimation, while ensuring that the archival values of provenance, contextual transparency, and ethical access remain central to the development process.

RELATED WORK

Recent projects such as those from Meta Reality Labs (Schwarz et al., 2025) and Luma AI (Fleisher & Anlen, 2018) have demonstrated the technical potential of image-to-3D scene generation. However, these initiatives often lack ethical guardrails, archival alignment, or participatory design processes. Studies on heritage-specific applications using Neural Radiance Fields (Condorelli & Luigini, 2024) or Gaussian Splatting (Jamil & Brennan, 2025) show how immersive visuals can be achieved from limited source materials but rarely embed stakeholder oversight or institutional needs. Recent AI & Society research reinforces these concerns. For instance, Reusens et al. (2025) emphasize the potential of large language models in enhancing archival access, while warning of hallucination risks and the need for curated, institution-specific prompting. Jaillant & Zhao (2025) highlight the complex ethical, infrastructural, and access-related tensions in unlocking born-digital records with AI, urging collaborative and interdisciplinary frameworks to avoid deepening archival inequalities. Their editorial and associated articles argue for a "digital archival mindset" that recognizes both the scale and fragility of digital collections. Baron (2025) presents a focused case study on applying AI to the U.S. government's FOIA workflows. His work demonstrates how machine learning classifiers and large language models can be used both to detect sensitive material and to generate narratives that justify redactions in a transparent, user-oriented way. This dual application—classification and narrative generation—offers a compelling model for integrating AI into archival access workflows while maintaining human oversight and trust. Scholars have pointed to these gaps, noting the need for participatory and archivally responsible systems (Clark & Lischer-Katz, 2020; Hazan, 2023). Lin & Hu (2025) emphasized the educational value of co-creative immersive experiences, while Roumana et al. (2022) argued for the pedagogical utility of 3D cultural tools built with stakeholder input. This project builds on those principles by combining off-the-shelf AI tools with a participatory design process in an archival setting.

SYSTEM DESIGN AND METHODS

The prototype system aims to transform verified—defined as images confirmed through archival appraisal for originality, authenticity, and provenance. Images with ambiguous or artistic content are excluded—, high-resolution archival photographs into navigable VR environments using a structured and modular pipeline. Rather than developing new AI models, the system integrates existing open-source tools and frameworks with archival workflows. Key steps include:

- **Input**: Archival photographs with structured metadata (e.g., date, location, event, people).
- **Processing**: Application of AI-based monocular depth estimation and mesh generation.
- **Output**: Navigable scenes viewable on Meta Quest 2, built using modular tools compatible with immersive VR environments.

To avoid ethical risks, the system excludes low-resolution images, artistic renderings, or speculative reconstructions. The system uses AHS's AMP metadata, based on a customized Dublin Core standard. Descriptive fields—like date, location, subject, and creator—are used to guide image selection, inform AI scene generation, and embed context into the VR environment. This decision reflects broader findings in AI archival studies: Taurino et al. (2025) demonstrate how archival AI pipelines must integrate privacy protections such as automated face-blurring, while Arias Hernández & Rockembach (2025) show how trustworthy AI systems require archivist involvement and careful metadata management to mitigate bias and ensure contextual fidelity.

The architecture includes placeholders for future integration with linked open data platforms (e.g., Wikidata), following Coleman et al. (2025) and Toth et al. (2025), who advocate for knowledge systems that surface multiple perspectives and maintain source transparency.

PARTICIPATORY CO-DESIGN METHODOLOGY

A three-phase participatory design process underpins the module's development:

- Needs Assessment: Interviews with archivists, users, historians, UX designers, and AI developers identify institutional constraints, values, and potential use cases.
- Co-Design Workshops: Participants engage in design walkthroughs, metadata mapping exercises, and ethical scenario planning to shape the system interface and functionality.
    - In these sessions, participants help define interface features, choose appropriate open-source AI tools, and determine which metadata fields are essential for reconstruction. Mapping exercises guide input parameters and how metadata appears in VR. Ethical scenarios—such as cultural misrepresentation, speculative rendering, and representation of marginalized subjects—are used to develop responsible design responses.
- Prototype Testing: A minimum viable module is tested using the System Usability Scale (Brooke, 1996) and qualitative feedback from participants, including reflection on interpretability and trust.

This design strategy is inspired by plural context frameworks (Coleman et al., 2025) and archival co-production principles that emphasize multiplicity and informed user control (Toth et al., 2025).

CONCLUSION

This short paper presents a participatory, metadata-driven approach to designing an AI module that transforms archival photographs into immersive VR environments. By prioritizing system feasibility over speculative historical accuracy, the project offers a grounded model that aligns with archival ethics, usability needs, and institutional realities. Drawing from recent research in AI and archival practice, it emphasizes the importance of transparency, stakeholder involvement, and interpretive flexibility. The Arizona Historical Society serves as a practical and symbolic site to explore how regional archives can engage with immersive technologies without compromising provenance or context. As a work in progress, the project contributes to the development of responsible, scalable frameworks for heritage institutions interested in experimenting with AI-generated immersive access rooted in archival values and co-designed by interdisciplinary stakeholders.

GENERATIVE AI USE

Researcher employed Grammarly for the purposes of paraphrasing and grammar editing. All outputs were carefully reviewed and revised by the author to ensure factual accuracy, clarity, and alignment with the paper's original intent. The author assumes full responsibility for the content of this submission.

AUTHOR ATTRIBUTION

The sole author was responsible for conceptualization, methodology, investigation, project administration, writing – original draft, and writing – review and editing.

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Designing Educational Games for Deepfake Detection

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ABSTRACT
Deepfake technology presents serious risks, especially for seniors vulnerable to misinformation. This paper reports on a participatory design workshop where seniors created low-fidelity educational game prototypes simulating real-world deepfake scenarios, highlighting key design principles such as real-world contexts and interactive feedback. The findings demonstrate the helpfulness of using participatory design to create educational games for seniors.

KEYWORDS
Deepfake, Educational games, Participatory design, Seniors, Misinformation

INTRODUCTION
Deepfake technology creates realistic fake videos that spread misinformation, enable fraud, and affect politics (Matli, 2024). As detection becomes harder, effective education is vital. Traditional digital literacy methods may not fully engage users in learning to detect deepfakes (Dhahir et al., 2024). In contrast, educational games provide a more engaging way to teach misinformation detection (Kiili et al., 2024). Yet, most research targets technical AI solutions, neglecting human-centered strategies that help users independently evaluate content (Abbas & Araz Taeihagh, 2024).

This research aims to address this gap by developing educational games through a participatory design (PD) workshop to enhance people's deepfake detection skills. The workshop aimed to create low-fidelity deepfake game prototypes tailored for seniors, who often face challenges in identifying deepfakes due to varying digital literacy and technology exposure (Moore & Hancock, 2022). Since seniors are typically more vulnerable to misinformation (Tang et al., 2024), they were involved to provide insights based on their experiences and learning needs. Involving them in the design process helped ensure the content was accessible, relevant, and effective for this age group.

METHODOLOGY
The study included 18 seniors, with 14 females and 4 males. All were aged between 55 and 85, with an average age of 71. This sample size aligns with previous PD studies (LaMonica et al., 2021; Paramita et al., 2023). Recruited from a local senior center, participants had diverse education levels and work backgrounds, such as education, engineering, and business. Most had gaming experience, which facilitated their workshop involvement. They were split into two groups of nine. Each group had 7 females and 2 males; Group 1 participants were aged 63 to 75, and Group 2 ranged from 67 to 85. Participants received compensation to acknowledge their time and effort.

The PD workshop was a two-hour, in-person session held in a seminar room and followed a structured five-step process based on Hansen et al. (2019). After a briefing on deepfakes, detection strategies, and basic game design principles, participants brainstormed game ideas in small groups. They then created low-fidelity prototypes using paper and markers. Each group presented its game concept, highlighting mechanics and educational goals. The session ended with feedback on each design's strengths and areas for improvement. Four facilitators were present during the workshop. Their responsibilities included delivering the initial briefing, guiding group discussions, answering questions, and ensuring smooth progression through each activity stage.

RESULTS
The workshop revealed how seniors conceptualized deepfake risks as multifaceted threats that extended beyond mere video manipulation to real-world consequences, such as financial loss and privacy breaches. Initially, participants associated deepfakes primarily with fake videos but gradually deepened their understanding to recognize the broader social and personal harms caused by deceptive digital content. This evolving awareness was reflected in their game designs, which emphasized scenarios involving trust exploitation and identity deception.

Group 1 created Deepfake Investment Trap, a game simulating a financial scam aimed at retirees to highlight the risks of trusting online videos without verification (Figure 1 below). Players begin with virtual money and watch deepfake videos promoting high-return investments (Figure 1, Part 1). They must then decide whether to invest (Part 2); choosing "yes" leads to simulated financial loss (Parts 3–5). Selecting "no" prompts requests for personal information (Part 6), which, if shared, results in further losses (Part 7).

Group 2 created Spot the Fake, a game that teaches players to identify deepfake videos through interactive analysis on a simulated Facebook platform (Figure 2 below). Players watch a mix of real and deepfake videos while scrolling through a social media feed (Figure 2, Part 1-2), then choose to "share" if they believe a video is real or "report" if they suspect it is fake (Part 3). If a player selects the wrong option, the game provides immediate feedback,

explaining why the video is or isn't a deepfake and highlighting key features like unnatural expressions or lighting inconsistencies (Part 4). Correct answers receive positive reinforcement (Part 5).

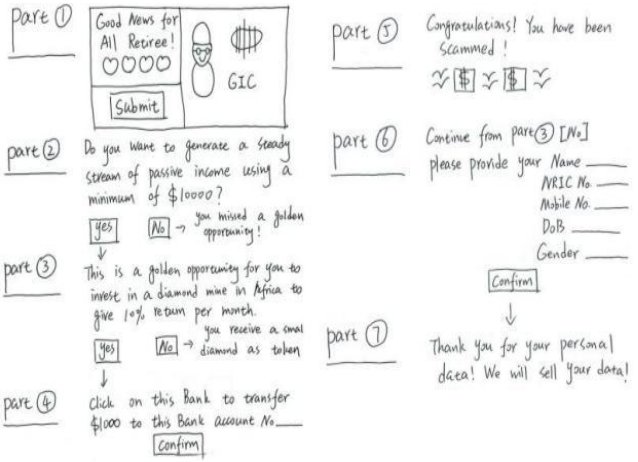

Figure 1. Deepfake Investment Trap

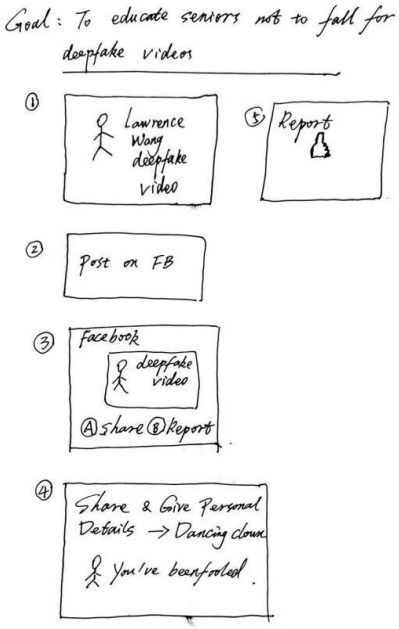

Figure 2. Spot the Fake

DISCUSSION

The PD workshop identified key principles for creating educational games that help seniors detect deepfakes, such as using real-world scenarios like financial scams or social media browsing to foster critical thinking in relatable contexts, consistent with experiential learning principles (Zou et al., 2024), and providing interactive feedback to support skill development. For example, Deepfake Investment Trap illustrated consequences like financial loss or data misuse, while Spot the Fake offered explanations after each decision, helping players understand why a video was real or fake and highlighting overlooked indicators.

Beyond game design, the workshop showed how seniors applied their understanding of deepfakes to develop interactive elements, drawing on their awareness of misinformation risks to create engaging scenarios. The collaborative process encouraged diverse perspectives (Bodker et al., 2022) and supported creativity, while the use of low-fidelity prototypes with simple materials allowed participants to quickly visualize and refine their ideas. This tangible approach (Permatasari & Cantoni, 2021) enabled seniors to explore game flow and functionality, ensuring complex concepts like deepfake detection were communicated clearly.

Lastly, the workshop's structure encouraged participants to engage with concepts of misinformation through design thinking processes, such as problem-solving and iterative ideation (Foster, 2019). By identifying challenges related to deepfakes and generating solutions through game design, participants were prompted to consider how misinformation affects users and how to communicate detection strategies in an accessible manner. This required them to adopt different perspectives, anticipate user needs, and reflect on the clarity and effectiveness of their designs (Dell'Era et al., 2020). Such engagement supports not only the acquisition of knowledge for deepfake detection but also the development of user-centered strategies to combat misinformation.

CONCLUSION

This study advances deepfake detection and educational game design by using PD to create tools that support seniors in detecting misinformation. Involving seniors helps ensure the game content reflects their experiences and preferences, making them more likely to accept and use it. The study also highlights the benefits of hands-on workshops, where seniors collaborate to develop educational programs they can understand and utilize. These efforts support future research on interactive tools that help seniors evaluate deepfake content.

However, the study has a few limitations. The small number of participants and focus on one geographical location may affect how widely the results apply. Future work should involve larger, more diverse participant groups across multiple regions in the participatory design workshop to gather a wider range of perspectives and ideas for developing educational games for deepfake detection. Work is also ongoing to translate the game designs into software prototypes, after which they will be evaluated.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author: Conceptualization, Data Curation, Formal Analysis, Investigation, Methodology, Project Administration, Validation, Visualization, Writing – Original Draft Preparation; Second Author: Conceptualization, Funding Acquisition, Methodology, Resources, Supervision, Validation, Writing – Review & Editing; Third Author: Conceptualization, Methodology, Supervision, Validation, Writing – Review & Editing

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Five Tools for Workshopping Humanitarian Responses to Harmful Information in Conflict Settings

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ABSTRACT
Harmful information spreads during conflict, causing significant problems due to the variation of forms it can take and ways it can spread. For humanitarian organizations operating in conflict zones, knowing how, when, and if to respond to harmful information while working to minimize further harm is a complex challenge. As demonstrated by a statement published by the International Committee of the Red Cross, civil society lacks the tools needed to address this challenge. This project responds to this statement by evaluating the efficacy of data governance tools. Results identify five tools humanitarian organizations can employ to unravel the complexity of each instance of informational spread, understanding that appropriate responses to these incidents can only be enacted after full explication.

KEYWORDS
harmful information; humanitarian organizations; conflict; information governance

INTRODUCTION
Harmful information is defined in two parts following Ulbricht and Rizk as information that is: "(1) false, misleading or hateful, or consist[s] of or encourage[s] violations of international law, in particular IHL, and (2) [has] the potential to influence harmful acts or otherwise contribute to harm against protected persons in conflict settings" (Ulbricht & Rizk, 2024). Harmful information can easily spread in conflict settings due to "weak governance systems [that] have limited ability to confront and prevent the dissemination of digitally generated materials" (Dilshad, 2023). With this in mind, this project responds to a call-to-action put forth by the International Committee of the Red Cross (ICRC): "to 'do no harm' while trying to respond to harmful information in conflict settings and avoid jeopardizing their integrity and credibility, humanitarian organizations must guide their actions through risk analysis exercises to assess both the protection risks of harm to civilians and humanitarian operations, and the organizational risks that can arise in certain responses" (International Committee of the Red Cross, 2025). Harmful information in conflict is known to have both short- and long-term effects (Tran et al., 2021). The acuteness of these effects and their growing implementation have led for calls for it to no longer be considered an allowable ruse of war, as propaganda has long been considered, although the status of this interpretation under IHL is unclear (Katz, 2020). In response, the ICRC released a guidance document (International Committee of the Red Cross, 2025) and typology of harms (Ulbricht & Rizk, 2024). These provide an extension of existing tools in this space, the majority of which do not apply to conflict broadly, but rather a facet of it; see the Medecins Sans Frontieres "MSF Listen" project to tackle health misinformation (Leyland et al., 2023) or the United Nations High Commissioner for Refugees (UNHCR)'s "Response Strategies" toolkit in the context of "protecting forcibly displaced and stateless people and the humanitarian organisations that work for them" (United Nations High Commissioner for Refugees., 2025). Other tools include guidelines for internal information sharing among humanitarian organizations, rather than respond to external informational contexts; see the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) Inter-Agency Standing Committee (IASC)'s Operational Guidance on Data Responsibility in Humanitarian Action (Inter-Agency Standing Committee, 2023). Thus, there is a need for a toolkit to respond to harmful information across all facets of conflict. This toolkit responds to that need.

METHODS
The five tools were identified and selected using the following criteria: their ability to unravel contextual complexity, their adaptability to a wide range of contexts, and their applicability to the needs identified by humanitarian organizations, as delineated earlier. Effectiveness was assessed by a close reading following Ohrvik's methods (Ohrvik, 2024) of the literature to identify organizational needs, then a close reading of the data governance literature to identify frameworks, with mapping completed between the two.

DISCUSSION
These tools can be used together or separately, as best fits the organization's scope and the context in which the tools are to be applied. Thus, metrics for success must be developed by organizations with a familiarity with the contexts in which they operate.

Data Ethics Decision Aid (DEDA)
DEDA is a framework originally built to "recognize ethical issues" in data projects, management, and policies (Utrecht Data School, 2022). Adaptations to the existing framework align its functionality to the context of the spread of harmful information in conflict.

McNealy Framework
This framework aids with identifying the ecosystem in which the harmful information is situated, assisting "with identifying the specific thing to be governed, that thing's relationships/connections that can and/or should influence govern choices, the institutions and societal structures that impact govern and who will be tasked with enforcement and implementation, and the environment(s) in which data governance must occur" (McNealy, 2021).

Visualization of Actors
Actors are typologized as local and international civilians, humanitarian operations, and organizations and delineated further within the context of the spread of harmful information in conflict (International Committee of the Red Cross, 2025).

Contextual Integrity (Norms)
Nissenbaum's framework of Contextual Integrity "demand[s] that information gathering and dissemination be appropriate to… context and obey the governing norms of distribution within it" (Nissenbaum, 2004). This is specifically explicated for the spread of harmful information in conflict.

Harms/Hazards/Risks
Violated norms result in harm. Harm is a broad swath of negative possibilities, while "an act or phenomenon is said to pose a hazard when it has the potential to produce harm or other undesirable consequences to some person or thing" (National Research Council (US) Committee on Risk Perception and Communication, 1989). Furthermore, "the concept of risk further quantifies hazards by attaching the probability of being realized to each level of potential harm" (National Research Council (US) Committee on Risk Perception and Communication, 1989). Scoped as such, I typologize informational hazards, harms, and risks for the spread of harmful information in conflict.

CASE STUDY
Colombia
"Despite the ongoing efforts to find a negotiated end to the armed conflicts, the humanitarian situation in Colombia continues to cause concern" (International Committee of the Red Cross, 2024) Since the peace agreement between the Colombian government and the FARC group was signed in 2016, social media has continued to have effects such as a vector incitement of "threats and crimes against social leaders" (Dajer, 2019). "With the rise of social media, the digital data of social and political leaders has become a dangerous source of information that allows criminals to identify, follow and threaten their victims more effectively" (Dajer, 2019). This has led to grassroots efforts to support these leaders, as well as tools by civil society to respond to threats. The active role of civil society complicates how humanitarian organizations might respond to harmful information in this context– namely, which local actors are already providing tools in this space and how external humanitarian organizations can support, rather than hinder, successful and proven initiatives. The McNealy Framework and Visualization of Actors tools could be used to explicate the full complexity of this context, identifying the ecosystem in which this harmful information spreads as well as who is involved and affected.

Ukraine
The use and spread of harmful information as a conflict tactic during the Russian invasion of Ukraine has been widely reported (Global Affairs Canada, 2022; Karalis, 2024; Roccatello & Knight, 2025). This spread has occurred on both traditional media channels and social media (Digital Forensic Research Lab, 2024). For humanitarian organizations operating in this space, the issue of responding to harmful information in this context is complicated by its wide-ranging spread, including "targeted propaganda efforts in different parts of the world, including Latin America, Africa, and the Middle East" (Digital Forensic Research Lab, 2024). These varied contexts bring with them varied information ecosystems, actors, and norms. A response that is appropriate in one context may not be appropriate in another. Thus, it is essential to fully explicate each individual regional context of harmful information transmission. The full toolkit of all five tools could be used in each regional context to complete this explication– from the details of the harmful information itself, to data ecosystem of each region, to the actors present, to the norms of the flows of information between those actors, to the harms/hazards/risks brought to bear by those flows.

CONCLUSION
This work contributes five context-responsive tools humanitarian organizations can use to explicate the complexity of instances of the spread of harmful information in conflict. By employing these tools, organizations can more appropriately respond to instances of harmful information in conflict with thoughtful intentionality.

GENERATIVE AI USE
I confirm that I did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION
Author: conceptualization, data curation, formal analysis, investigation, methodology, project administration, validation, visualization, writing – original draft, writing – review & editing

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“Hard Drives Are the Tip of the Iceberg”: Using r/datahoarder to Understand Conceptions of Data Risk

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ABSTRACT
r/datahoarder is a subreddit on the popular news aggregation and social media platform Reddit. Focused on individual and communal endeavors to gather and preserve a variety of digitized and born-digital data, r/datahoarder as a community coalesced around addressing perceived failures to save data across corporate, and governmental settings. While the impetus for engaging in datahoarding varies, this study examines key motivators for this work in a contemporary political context. This study shows that the key motivators expressed on r/datahoarder reveal new kinds of risk and approaches to address them that exist outside of digital settings, such as those denoted in the Digital Preservation Coalition’s Risk Framework.

KEYWORDS
digital curation; datahoarding; Reddit; data risks; communities of practice

INTRODUCTION
What key motivators for datahoarding in a contemporary political context are expressed by members of r/datahoarder? Originating in May 2013, r/datahoarder represents a community of individuals focused on the preservation of data across a variety of digitized and born-digital settings. Broadly defining all these things, members of r/datahoarder, who describe their impulses as a “digital disease”, see their work as akin to informal data librarianship (r/datahoarder, 2017). Gaining visibility for their work documenting social media data arising at the January 6th, 2021, United States Capitol Attack (Harel, 2022), as of April 2025 the subreddit includes over 850,000 members. Past work has studied how the subreddit acts as a community of practice, as well as the role of “calls-to-action” which motivate members: motivations to act to ensure the ongoing access, preservation and use of data, prompted by actual or anticipated threats from corporations, governments, and research entities (Maemura & Wagner, 2025).

While the practices deployed by members of r/datahoarder frequently skirt legality and often make use of a variety of personal and private storage practices, little academic scholarship exists on how these communities conceptualize data risks. Data risks are “multidimensional and nuanced” (Haimes, 2009), as well as carry subjectiveness (Aven, 2008). Given the wide range of perspectives of all types, including political ones, inherent in participants of r/datahoarder, we define risk very broadly: the probability of an adverse event occurring, as well as the impact of that event should it occur (National Research Council, 1989).

Past work on the subreddit has revealed additional general key motivators, not directly connected to risk, for datahoarding work. This includes, in the case of datahoarding surrounding the aforementioned Capitol Attack, “a desire to contribute to law enforcement efforts, enact punitive justice upon the rioters, engage in public discourse, and preserve information for posterity” (Chapman, 2023). Past work on risk in digital preservation has explicated how risk is socially constructed (Frank, 2020). In response, this study conducts a review of posts to locate how key motivators for data risks are conceptualized within r/datahoarder and, in particular, how these conceptualized notions of risk align with and depart from professional ideals.

METHODS
Our method centers on a scoping of relevant literature, data collection, and analysis. The collection of data occurred between January and May of 2025. The first author gathered 130 posts regarding datahoarding in a contemporary political context. These posts were selected through daily visits to r/datahoarder where each post of the past 24 hours was reviewed for political content focusing on the post title, text, and comment text. Political content was defined as content discussing “the subset of social relations characterized by conflict over goods in the face of pressure to associate for collective action, where at least one party in the conflict seeks collectively binding decisions and seeks to sanction decisions by means of power” (Warren, 1999). In this context, “goods” are understood to be data and “to sanction decisions by means of power” is understood within the context of curtailing free access to that data.

The frequency of posts and participation on the subreddit was tracked throughout data collection. With the collected data, the authors worked to identify key motivators of risk delineated in the posts. This is defined as expressed motivations for undertaking datahoarding work in order to respond to the probability of an adverse event occurring. This involved a close reading of the posts and mapping to the DPC Risks Framework (Digital Preservation Coalition, 2025). We employed close reading methods following Ohrvik’s methods (Ohrvik, 2024): establishing readability and purpose, exploring the text and making observations, and interpretation of those observations and

analysis. The mapping process was part of this final step and took place to find both alignment and divergence of key motivators of risk as expressed by the DPC. Given the preliminary state of this study, further work must be completed to ensure robust reliability and validity.

Our findings focus on general rather than case-specific observations to respect user anonymity and due to concerns of re-identification of anonymized data (Lubarsky, 2017). While Reddit data is technically public in nature, the researchers understand the tensions between public social media accounts and private engagements with this media to be deeply complicated and that further concerns around researchers engaging in unethical AI-driven research intensified such tensions (Proferes et. al, 2021; Galperina, 2025). In order to mitigate researcher bias throughout the study, both authors cross-validated their findings throughout the research process, as well as sought third-party feedback on their research process.

FINDINGS

Departing from the definitions of risk from the Digital Preservation Coalition (DPC) (Digital Preservation Coalition, 2025), we show how members of r/datahoarder position their work implicitly and explicitly in contrast with governments, corporations, and cultural heritage institutions as arbiters of digital preservation. This comparative analysis between professional standards and the communal data hoarding work of these Reddit users reveals how ideas of data risk exist in sociocultural contexts informed by prescient global events. In this case, our data collection and observations of the subreddit coincided with the reemergence of the Trump administration in the United States and concerns for the emergent disappearance of public data, which affects both U.S.-based and global users (Thylstrup & MacKinnon, 2025).

Further, the increasingly politicized nature of such events reveals a sociocultural flattening of particular data risks while highlighting the presumptive role anti-risk endeavors place on government entities to follow practices of compliance, transparency, and accountability (Digital Preservation Coalition, 2025). In highlighting these tensions across a variety of stories about r/datahoarder and utilizing the content of the subreddit, this study troubles the imagined political neutrality of a space like r/datahoarder as conceptualized by the users given that their own reliance on tools and repositories whose mitigation of risk, and key motivators of practice, rely on non-institutional support and labor.

We find that participants of r/datahoarder express key motivators around risks that match some of the key motivators included in the DPC's Risks framework (Digital Preservation Coalition, 2025). We also find that participants express key motivators that are not included in the framework. A sample of this is delineated in Table 1. These findings demonstrate that the key motivators expressed on r/datahoarder are socially constructed and, as a result, do not fully map onto institutional frameworks of digital preservation.

Risk	Key Motivator (DPC)	Key Motivator (Users)
Unprepared and unknowledgeable actors deleting data based on broad metadata searches.	Authenticity; Continuity; Compliance; Memory; Enabling Research; Technology	Lack of Knowledge
Fear that specific data a hoarder has a fondness for will be deleted.	Accountability; Continuity; Compliance; Memory; Enabling Research	Endearment
Holding off a collapse of the data preservation system.	Continuity; Memory; Reputation; Technology	Nefarious Intent

Table 1. Classification of Key Motivators in r/datahoarder

CONCLUSION

We classify key motivators for data risks expressed in r/datahoarder and find that these do not solely map on to institutional motivators. Instead, we find that key motivators for this work are socially constructed, deriving from within the community. Further work will situate this phenomenon within McNealy's data ecosystem framework (McNealy, 2021) and Dallas' data curation "contact zone" (Dallas, 2016). This will facilitate further investigation into the context surrounding how participants of r/datahoarder conceptualize neutrality within the contexts in which they work.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

First Author: conceptualization, data curation, formal analysis, investigation, methodology, project administration, validation, visualization, writing – original draft, writing – review & editing; Second Author: conceptualization, formal analysis, funding acquisition, methodology, supervision, validation, visualization, writing – original draft

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Beyond Technology-First Narratives: Reframing Rural Educators as Information Professionals

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ABSTRACT

National programs for educational technologies often emphasize online learning, built on claims of universal access and improvement. However, these narratives frequently overlook the complex educational contexts of marginalized rural communities, such as those in Nigeria. This paper reframes rural educators in Nigeria as information professionals who engage in community-specific knowledge dissemination, advocacy, and literacy development. Drawing on critical rural theory, decolonial pedagogy, and information behavior models, this conceptual paper argues that rural educators enact the very functions ascribed to information professionals. As a work-in-progress paper, it calls for contextually relevant educational practices and outlines future directions for empirical study, policy, and LIS curriculum development.

KEYWORDS

Educational Technology, Rural Education, Information Professionals, Critical Rural Theory, Information Behavior, Decolonial Pedagogy, Nigeria

INTRODUCTION

Global education is experiencing significant transformation due to the increasing reliance on educational technologies for online learning. Online learning initiatives, especially since the COVID-19 pandemic, have been highly prioritized for their flexibility, affordability, and accessibility (Carabregu-Vokshi et al., 2024; Dhawan, 2020). This narrative presents a premise for development in learning but overlooks the complex lived realities of diverse educational contexts, particularly in rural areas. In Nigeria, where over half the population resides in rural areas, the push for technology-first solutions promotes coloniality of the education structure and ignores systemic inequities in infrastructure, language, and cultural context.

This paper responds to these limitations by reframing rural educators as information professionals who reinvent contextual-relevant ways in which rural communities can fully benefit from education and learning. Drawing from critical rural theory (Pfrenger, 2024), decolonial pedagogies (De Lissovoy, 2010; Omodan & Diko, 2021), and information behavior theories (Chatman, 1999; Dervin, 1998), it argues that rural educators in Nigeria perform core information functions despite being excluded from dominant educational technology discourses. This reframing promotes a shift from deficit perspectives to contextually empowered roles.

LITERATURE REVIEW

Educational Technologies in Global and Nigerian Contexts

Educational technologies are often promoted as transformative tools for democratizing learning. Their adoption in developing nations is justified through innovation diffusion theories (Wani & Ali, 2015), where perceived novelty leads to adoption (Granić, 2022). However, the imposition of platforms like MOOCs (Ma & Lee, 2017, 2019) or Intelligent Tutoring Systems (Nye, 2015) in sub-Saharan Africa is unaligned with local infrastructural and sociocultural realities (Abdulmajeed et al., 2020; Ssekakubo et al., 2011).

In Nigeria, EdTechs are sold with the euphoric promise of disrupting the education system. It is categorized as a must-have investment if Nigeria is to be holistically and comprehensively fixed educationally. Policymakers stress its inevitability (Matthew et al., 2021: 319), necessitating a complete overhaul of the education curriculum to integrate technological inventions (Onyema, 2019). To ascertain the validity of this assertion, the complexities from which the Nigerian society and its education system stem must be understood. These one-size-fits-all approaches perpetuate what Pfrenger (2024) calls "urbanormativity," which privileges urban, technologically saturated environments as normal.

Critical Rural Theory and Decolonial Pedagogy

Critical rural theory, propounded by Thomas et al. (2011) and further elaborated by Pfrenger (2024), sets a new theoretical framework for reconceptualizing place-making, identity formation, curricular design, and policy implementation, by challenging dominant discourses that frame rural spaces as lacking and emphasizes the unique cultural, linguistic, and social assets of rural communities. Decolonial pedagogy by De Lissovoy (2010) and Omodan & Diko (2021) complements this by resisting epistemic dominance from the global North and validating indigenous knowledge systems. Both frameworks offer tools to critique and redesign education in ways that center marginalized voices.

Information Behavior and the Role of Information Professionals

Library and Information Science (LIS) theories offer models that align closely with the work rural educators perform, like Chatman's Theory of Life in the Round (1999), which highlights how marginalized populations seek, use, and share information within tightly-knit communities. In rural Nigeria, educators are regarded as trusted figures who provide contextually relevant information. For example, rural educators used mobile phones and informal networks to educate and communicate health updates in local, understandable dialects (Sanusi et al. 2020). Similarly, Dervin's Sense-Making Theory (1998) focuses on how people construct meaning through contextually relevant information practices. Rural educators, in disseminating, contextualizing, and advocating for knowledge, act consistently with these information behavior theories by adapting curriculum to local knowledge to help students make sense of unfamiliar content. These practices mirror curriculum adaptation, reference services, information literacy, and community advocacy, which are similar to information professional services.

REPOSITIONING RURAL EDUCATORS AS LIS PROFESSIONALS

Understanding the Context

Rural communities in Nigeria are characterized by high levels of poverty, low infrastructural investment, and linguistic and cultural diversity (Egbe, 2014; David, 2009). They are frequently excluded from centralized educational reforms, but have maintained robust contextual informal education systems, such as the Almajiri system in the North or the mentor-apprentice business education models in the East (Iwunna et al., 2021; Waziri & Hall, 2019). Educators occupy diverse roles in these settings, such as offering instructional classes to not only children, but also to youths, adults, and helping them interpret ways policies affect their communities.

The Educator's Role

Kumar (2016) and Nwokocha & Chimah (2016) posit, the role of information professionals involves curating information services to meet the local needs of community members. Despite the reality of being under-resourced, rural educators adapt the curricula to local needs, conduct outreach, collaborate with libraries, and engage in information advocacy, which are duties of information professionals (as shown in Figure 1). For example, in Kwara State, schools leveraged local networks and public libraries to transform into community knowledge hubs (Global Partnership for Education, 2022). The NewGlobe Education also reported success by partnering with rural teachers to co-design and co-adapt curricula based on locally available infrastructure (Cairneagle, 2019).

Mapping Educators to LIS Roles

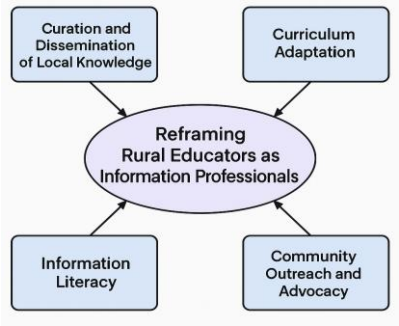

Figure 1 Overlap between rural educators' practices and LIS professionals.

Implications for LIS and Education Policy

Rather than imposing solutions, edtech designers should co-design technologies with rural educators, leveraging their local knowledge. Design methods should include participatory action research and human-centered design. LIS programs in Nigeria and globally should consider integrating rural education modules to prepare future professionals for community-based information work. Policymakers must recognize rural educators as community information leaders, provide training and certification in LIS-related skills, and support infrastructure tailored to community needs rather than replicating urban models.

CONCLUSION AND FUTURE RESEARCH

The paper offers a much-needed counter-narrative to Western-centric educational technology discourses, encouraging readers to reflect on the epistemic assumptions embedded in development and technology innovation. It successfully draws connections between education, information science, and development studies, appealing to a wide range of professionals and researchers. The reframing has direct implications for educational technology design and deployment, curriculum planning, and rural knowledge infrastructure design. Future research will analyze and present findings from qualitative interview data with rural educators to empirically validate this reframing. Comparative case studies across global South communities could further test the transferability of this model. Finally, this perspective informs more inclusive policies and practices in LIS and education.

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Intersectionality and Insider/Outsider Dynamics in Mental Health Information-seeking among Chinese LGBTQIA+ Immigrants in the US

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ABSTRACT
This pilot study applies intersectionality and insider/outsider dynamics to examine mental health information-seeking practices among Chinese LGBTQIA+ immigrants in the US. Through semi-structured interviews and thematic analysis, the findings reveal that intersecting identities influence participants' perceptions of insiders and outsiders when seeking mental health information. Participants further categorized insiders into social types based on behaviors, authority, and intimacy. Information and communication technologies (ICTs) facilitate interaction among trusted insiders across geographic distances. This study advocates for the design of culturally competent mental health information resources that reflect intersecting identities and insider trust dynamics.

KEYWORDS
intersectionality; insider/outsider; information-seeking; mental health information; Chinese LGBTQIA+ immigrants

INTRODUCTION
Asian LGBTQIA+ immigrants face significant mental health challenges due to systemic discrimination and exclusion in the US (Ching et al., 2018). Credible mental health information can improve their mental health conditions by increasing knowledge, facilitating effective communication with healthcare providers, and fostering a sense of belonging while reducing stigma (Berry et al., 2017; Morahan-Martin, 2004). Seeking health information online is a common practice among LGBTQIA+ individuals, Asian Americans, and immigrants, enabling connections with others with similar identities and experiences (Augustaitis et al., 2021; Jang et al., 2018). Additionally, they rely on close connections for health information—family members are a vital source of health information for Asian Americans and immigrants (Lee et al., 2022), whereas LGBTQIA+ individuals turn more towards friends and peers who share similar identities (Kitzie et al., 2022). Communities are essential sources for tailored health information through knowledge creation and sharing (Chen et al., 2010; Jang et al., 2018; Kitzie et al., 2022). However, focusing on the LGBTQIA+, Asian American, or immigrant identity separately can limit our understanding of how multiple identities intersect to shape information-seeking practices. Moreover, while social networks are recognized as an essential health information source, little is known about how individuals with intersecting identities decide whom to trust for mental health information. With an intersectionality lens, this pilot study employs a qualitative design to explore the research question: How does intersectionality structure insider/outsider dynamics among Chinese LGBTQIA+ immigrants in the US as they seek mental health information?

THEORETICAL ORIENTATIONS: INTERSECTIONALITY AND INSIDER/OUTSIDER DYNAMICS
Insider/outsider dynamics offer a lens for understanding how individuals navigate the boundaries of trust and belonging in their information practices to avoid risks. Insider status is legitimized by shared norms, values, and experiences within social groups; insiders are often viewed as relatable and trustworthy, with privileged access to certain internal information (Chatman, 1996, 1999). Incorporating an intersectionality perspective expands this understanding by highlighting that individuals' experiences are simultaneously shaped by interlocking systems of power, including race, gender, sexuality, class, and ability (Collins & Bilge, 2016). Thus, Chinese LGBTQIA+ immigrants' mental health information-seeking practices are not defined by a single identity category. Instead, their intersecting identities position them on the edges of multiple social networks (Thompson, 2006), which can reinforce different, sometimes conflicting, social norms. Intersectionality complicates their insider status in social groups, affecting whom they perceive as trustworthy insiders for mental health information.

METHODOLOGY
This pilot study applies a qualitative design. Five participants were recruited through purposive and snowball sampling with the following criteria: 1) 18 years or older, 2) self-identifying as LGBTQIA+, 3) born in China without US citizenship at birth, 4) self-identifying as Chinese or Chinese American, and 5) continuously living in the US for at least one year. I conducted semi-structured interviews via Zoom between November and December 2024, with durations ranging from 43 to 88 minutes. Two of the interviews were conducted in English, other three were in Mandarin. The interviews focused on participants' mental health concerns, their mental health information-seeking practices impacted by identities, and the roles of communities in mental health well-being. All interviews were recorded and transcribed verbatim with participants' permission. The data were analyzed using thematic analysis, which aims to identify patterns to understand a social phenomenon (Glesne, 2016). Transcripts were first

inductively coded using open coding to identify initial codes that captured participants' experiences; then, axial coding was applied to group related codes into broader categories (Saldaña, 2021).

FINDINGS AND DISCUSSIONS

Drawing the line between insider and outsider based on the Chinese LGBTQIA+ immigrant identity

Members within the Chinese LGBTQIA+ communities are insiders in participants' information worlds; those insiders can be trusted and have the knowledge to address their mental health concerns. Will (Man, Gay, 1.5 years in the US) regarded Chinese LGBTQIA+ communities as safe spaces for discussing mental health concerns, while "outsiders of these communities, no." Kevin (Man, Gay, about 8 years in the US) emphasized the insider knowledge among the community members: "Especially when it comes to issues related to struggles of immigrant or romantic relationships, I think I'd prefer to get advice from someone within my community." Participants also identified outsiders of mental health information based on their identities. Most participants noted that they would not seek mental health information from their parents because of their gay identity. The boundary between insider/outsider is also created by racial/ethnic backgrounds. When interacting with a non-Chinese therapist, Howard (Man, Gay man, about 6 years in the US) felt that "she had a hard time understanding Chinese people's situations. Like, I just felt like she couldn't relate." Participants also did not always feel like insiders in the American LGBTQIA+ space. Jarret (Man, Gay, about 5 years in the US) noted, "being Chinese, being Asian, and also being an immigrant, I'm not really part of their community. I feel there's a kind of boundary." Therefore, he rarely sought mental health support from these communities while knowing they may have some resources.

Social types among insiders

Participants categorized people within Chinese LGBTQIA+ immigrant communities based on the member's behavior (Burnett et al., 2001). Despite perceiving the Chinese LGBTQIA+ community as a "safe harbor," Will pointed out that "sometimes people, I mean, they're just bystanders, and sometimes some people don't empathize." Someone's cognitive authority in a special knowledge domain is also a criterion of social types. For Howard and Will, the knowledge of mental health that insiders gained through education and formal mental health services increased the trustworthiness of the information they provided. Social types are also related to intimacy. Participants drew a clear boundary between friends and others in a community. While hanging out with some Chinese gay people he knew through social media, Jarret noted, "…you wouldn't turn to them for mental health support, you wouldn't even consider them as an option." Partners are a more trusted source of mental health support due to closer intimacy—"I just didn't feel comfortable sharing it completely [with friends] because it was different from the sense of support and intimacy from a partner" (Jarret).

ICTs and insiders across geographic boundaries

Participants heavily relied on WeChat, a Chinese social media platform, for mental health information and support. Group chats on WeChat connected members of Chinese LGBTQIA+ communities in different places together: "We have a WeChat group for Chinese gays, and there are people from all over the world, like those studying abroad, and we chat sometimes" (Howard). WeChat also enables participants to connect with their close gay friends in China, as Jarret said, "using social media as a medium to help me keep in touch with some close friends back home." While the insider status of a small world is sometimes related to geographic proximity (Burnett & Jaeger, 2008), ICTs, like WeChat, facilitate participants' access to mental health information from understanding insiders, including members of the Chinese LGBTQIA+ immigrant community and their close gay friends in China, across geographic boundaries between different states in the US and between China and the US. The use of ICTs, therefore, enables Chinese LGBTQIA+ immigrants to moderate the lack of culturally competent mental health information resources in the US created by intersecting marginalization.

CONCLUSION

Integrating intersectionality and insider/outsider frameworks, this study offers a nuanced understanding of mental health information-seeking practices among Chinese LGBTQIA+ immigrants in the US, contributing to more culturally competent information support and services. Findings reveal that Chinese LGBTQIA+ immigrants define insiders and outsiders of their information world based on their intersecting identities. Furthermore, participants create boundaries among different social types within a community based on insiders' behaviors, authority, and intimacy. These boundaries can protect them from risks, such as judgment, rejection, irrelevant information, or discrimination when seeking mental health information from outsiders (Chatman, 1996). ICTs enable participants to maintain connections with trusted insiders across geographic divides, buffering the marginalization and exclusion in the US created by intersecting power systems. To be considered as insider knowledge, mental health information resources need to be designed in a way that acknowledges and reflects the intersecting identities of potential users. For example, creating multilingual mental health guides, culturally tailored peer-support programs, or community-based forums can foster trust and a sense of belonging among individuals who embody multiple marginalized identities.

GENERATIVE AI USE

This manuscript was assisted by Grammarly for grammar, spelling, punctuation, and improving clarity in writing. ChatGPT was employed to assist with translating the excerpts from Jarret, Howard, and Kevin from Chinese to English. The AI-assisted content was reviewed and edited by the author. The author assumes all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

First Author: conceptualization, data curation, formal analysis, investigation, methodology, writing - original draft, writing - review & editing.

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User Studies in Generative Interactive IR (GenIIR): An ISIC-Informed Systematic Review

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ABSTRACT
This poster presents a systematic review of 98 user studies in Generative Interactive Information Retrieval (GenIIR), exploring how users engage with GenAI in interactive information-seeking contexts. Guided by the Information Seeking in Context (ISIC) framework, we examined two key dimensions: ***Research Focus*** and ***Information Context***. Our results show that most studies examined user perceptions and information behavior, while many also addressed system design evaluation. These studies covered diverse domains and user groups. The most common settings were general, health, and education domains. Participants were primarily general users or students, and these studies often involved public tools like ChatGPT. Other studies focused on professional domains and custom GenAI systems, where interaction context, user roles, and task environments were more specialized, highlighting ISIC's emphasis on context-sensitive information behavior. These patterns reflect the accessibility of public tools and a rising emphasis on context-sensitive system design. This review provides insights into developing context-aware, human-centered GenAI systems.

KEYWORDS
Generative AI, Generative interactive information retrieval (GenIIR), user study, information seeking in context (ISIC)

INTRODUCTION
The rise of Generative AI (GenAI), such as ChatGPT, has transformed user interaction with information systems from keyword retrieval to real-time conversational content generation and evaluation (White, 2024). This shift has led to the emergence of Generative Interactive Information Retrieval (GenIIR), which, unlike traditional IIR, emphasizes user-GenAI information interaction and dynamic engagement throughout the search process (Trippas et al., 2025). In this evolving context, user studies are essential for revealing authentic users' information needs, behaviors, and evaluation strategies, whose insights are not captured by automated metrics (Kelly & Sugimoto, 2013; Liu & Shah, 2019; Rong et al., 2024). To examine diverse user-GenAI information interactions, we adopt the Information Seeking in Context (ISIC) framework, which views information behavior as shaped by situational, personal, and social factors (Agarwal, 2022; Ingwersen & Järvelin, 2005). ISIC helps explain how actor, task, information need, environment, and actor–source relationships vary across diverse generative information interactions. Using this lens, we conducted a systematic review of 98 GenIIR empirical user studies, focusing on two key dimensions: ***Research Focus*** (study purpose) and ***Information Context*** (where and how GenAI is used). This dual lens provides a structured view of GenIIR user studies and informs context-aware, human-centered GenAI system design and evaluation.

METHODOLOGY
We conducted a systematic review of empirical user studies in GenIIR, following established practices in IIR and HAI (e.g., Jiang & Liu, 2024; Kelly & Sugimoto, 2013; Liu, 2021; Rong et al., 2024; D. Wang et al., 2024).

Inclusion and Exclusion Criteria. Studies were included if they: (I1) applied GenAI (e.g., GPT); (I2) investigated user information interaction (e.g., seeking or using information); and (I3) reported empirical user data (e.g., interviews, surveys, experiments). We excluded studies that (E1) lacked a GenAI or user focus; (E2) focused solely on algorithms or benchmarks; (E3) lacked methodological detail (e.g., participants or analysis); (E4) were non-empirical; or (E5) were inaccessible or in a non-reviewable language.

Search and Eligibility Screening. We conducted searches on five databases: Web of Science (Core and Preprint), Scopus, ScienceDirect, ACM Digital Library, and IEEE Xplore, using Boolean queries that combined three concept clusters: GenAI (e.g., GPT, LLM) AND IIR (e.g., interactive IR, information seeking) AND user studies (e.g., user study, participant). The searches were conducted on February 25, 2025, returning 1,043 records, reduced to 728 after deduplication. We first screened titles and abstracts, excluding 536 records. Then reviewed 192 full texts, and 94 were excluded. A total of 98 studies met all inclusion criteria. The studies span HCI, LIS, and interdisciplinary venues.

Coding and Validation. We developed a coding scheme grounded in the ISIC framework and prior IIR reviews (Agarwal, 2022; Kelly & Sugimoto, 2013; Liu & Shah, 2019), comprising two dimensions. ***Research Focus***

captured study purposes and variables. ***Information Context*** included three ISIC-informed subdimensions: *Application Domai*n (relating to environment and task setting), *User Type* (actor characteristics), and *Interaction Context* (source/system/channel). This structure highlights how user behavior varies across settings. Coding was conducted in MAXQDA. The primary coder conducted all coding, and a second coder reviewed a random sample of 20 studies; inter-coder agreement was high (Cohen's Kappa = 0.907), with minor disagreements resolved through discussion.

RESULTS

The results are summarized in a heatmap (Figure 1) and a chord diagram (Figure 2), illustrating how research themes and contextual features co-occur across the 98 included studies. Visualizations were produced in RStudio (v2024.12.1).

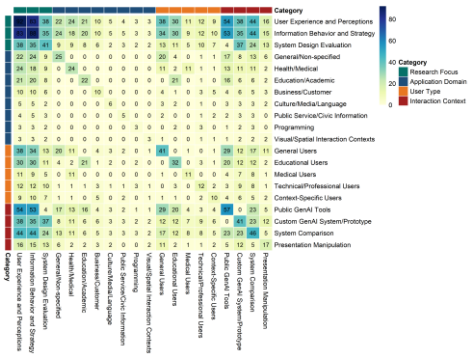

Figure 1. Heatmap showing co-occurrence frequencies

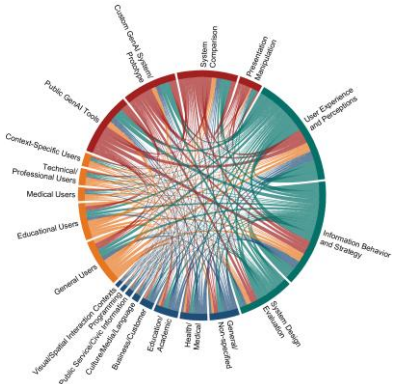

Figure 2. Chord diagram visualizing interconnections

Research Focus

Three key research areas emerged: (1) *User Experience and Perceptions* (n=92), examining trust, usability, risk, and satisfaction (e.g., Ayo-Ajibola et al., 2024; Sun et al., 2024; Yan et al., 2024); (2) *Information Behavior and Strategy* (n=88), investigating prompt use, evaluation, and search adaptation (e.g., Capra & Arguello, 2023; Qian & Wu, 2023; B. Wang et al., 2024); (3) *System Design Evaluation* (n=41), evaluating interaction features, interface layouts, and domain-specific tools (e.g., Anderl et al., 2024; Fok et al., 2024; Yan et al., 2025).

Information Context

Application Domain. GenIIR user studies were distributed across diverse domains. The most common were *General/Non-specified* (n=25), *Health/Medical* (n=24), and *Education/Academic* (n=22), together representing over 70% of the studies. Other domains included *Business/Customer* (n=10), *Culture/Media/Language* (n=6), *Public Service/Civic Information* (n=5), and *Programming* or *Visual/Spatial Interaction Contexts* (n=3 each).

User Type. *General Users* (n=41) were most frequently studied. *Educational Users* (n=32) included students (n=25), educators, and researchers. *Medical Users* (n=11) encompassed patients and healthcare professionals in clinical care. *Technical/Professional Users* (n=12) spanned work roles such as developers, industry experts, and creatives. *Context-Specific Users* (n=10) appeared in settings like customer service, extended reality (XR), or Indigenous communities.

Interaction Context. A majority of the studies (n=57, 58%) examined *Public GenAI Tools* like ChatGPT via general-purpose, text interfaces (e.g., Anderl et al., 2024). Others (n=41, 42%) explored *Custom GenAI System/Prototype* with structured interactions (e.g., clickable prompts, diagrams, sensemaking tools; e.g., Yan et al., 2025). Two notable setups included *System Comparison* (n=46), contrasting GenAI with search engines, experts, or interface variants; *Presentation Manipulation* (n=17) tested how response format or tone influenced trust and engagement.

DISCUSSION AND CONCLUSION

This systematic review reveals how user studies in GenIIR settings vary in research focus and information context, highlighting authentic and diverse user information needs and system configurations. While most studies focused on user perceptions and behavior, a substantial number also examined system design evaluation, suggesting increasing attention to interaction features and domain-specific support. Many studies used mixed data (e.g., perception, behavior, performance), reflecting a holistic evaluation of user-GenIIR information interactions. Most studies focused on general-purpose, health, and educational domains, using public GenAI tools with general or student users, likely due to their accessibility, though studies on professional and specialized contexts are emerging. Applying ISIC helps structure and explain the interaction between user roles, information tasks, and system environments in GenIIR settings. This review provides a structured synthesis of GenIIR user studies, clarifying

major research focuses and contextual patterns, and offering a foundation for more context-sensitive, human-centered GenAI system research.

GENERATIVE AI USE

ChatGPT was used to enhance English grammar and clarity. The authors take full responsibility for the content.

AUTHOR ATTRIBUTION

Afeng Wang: conceptualization, methodology, data curation, formal analysis, visualization, writing – original draft; Daqing He: supervision, conceptualization, methodology, validation, writing – review and editing; Zhimeng Luo: data curation, validation, writing – review and editing; Feicheng Ma: supervision, funding acquisition.

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Spatial Dynamics of Local News: Mapping City Co-Mentions in Alabama

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ABSTRACT
This study investigates how the relationships between cities are represented in local news by analyzing co-mentions of cities in 31,004 news articles from Alabama. Using a large language model, we extract geographic references and construct co-mention networks that reflect both spatial proximity and symbolic connections between cities. To interpret these links, we develop a classification framework of relationships between cities, such as common impacts and sequential dynamics. Our preliminary analysis reveals that news categories produce distinct patterns of spatial association. This offers a novel way for understanding media-driven spatial imaginaries, contributing to research on information geographies and shedding light on the relational dimensions of local information.

KEYWORDS
news; news deserts; city co-mentions; local information landscape; spatial network; large language models

INTRODUCTION
Local news not only documents diverse events but also shapes public perception of space and place in particular times by referencing and connecting geographic locations through stories. Understanding these connections helps interpret the spatial logic of media narratives and how localities are associated with social, political, and cultural dynamics. Prior work has examined how semantic relatedness between cities extracted from news shows evidence of distance decay effects (Hu et al., 2017). However, representations of places in news stories not only signify their physicality but also symbolic, psychological, and temporal aspects (Rentfrow & Jokela, 2016; Ho, 2021). Recent information science research further shows how places are encoded in information infrastructures, shaping how they are accessed and understood (Su et al., 2018; Purves et al., 2019; Söderström, 2023). Investigating media co-mentions of places offer a new opportunity to examine how places are interconnected across socio-physical dimensions within time-critical local information (i.e., events and news stories). Our study draws on these perspectives to analyze how local news constructs relational geographies through time-sensitive narratives, which shape public imaginaries of places and regional identity. We analyze city co-mentions in local news articles in Alabama to identify and classify narrative relationships between cities that reflect both geographic proximity and deeper socio-political, environmental, and cultural associations. Mapping them can help uncover connectivity and marginalization of spaces and places that may illuminate the formation of information deserts (Lee & Butler, 2019) or news deserts (Wang et al., 2025).

METHODS
Data Collection and Processing
We collected 31,004 news articles over 13 years (2012–2024) from a major local news outlet headquartered in Tuscaloosa, Alabama. We used GPT-4o to extract place names from each article. A test against 100 randomly selected news articles achieved an F1 score of 0.96 in accurately extracting place names. We retained only city-level locations and geocoded them using the Google Places API. We then assigned a topic to each news article using a labeler trained on the New York Times Annotated Corpus (Rubinovitz, 2017). The resulting 342 granular topics were grouped into 18 broader categories (e.g., sports, crime, politics) using GPT-4o, following the IPTC media taxonomy (IPTC, 2025).

Constructing the City Co-Mention Networks
We define a city co-mention as the occurrence of two cities within the same news article. To capture the diversity of spatial relationships, we developed a classification framework encompassing four types based on qualitative observations of news samples: (1) *common impacts*, referring to events (e.g., hurricane) that affect multiple locations; (2) *strategic relations*, which involve mutual benefits or agreements between cities, such as economic partnerships; (3) *sequential dynamics*, where events unfold across different places (e.g., a politician travels through multiple cities); and (4) *direct influence*, where actions or developments in one city lead to consequences in another. Based on these categories, we constructed a weighted, undirected network in which nodes are cities and edges represent co-mentions. Edge weights capture how often two cities are mentioned together. Co-mention networks were created both within and across categories. To do so, we prompted GPT-4o to assess each article and identify which type(s) of spatial relationships existed between co-mentioned city pairs. For example, the edge between Decatur and Wheeler National Wildlife Refuge was classified as a “common impact” in an article about a wildfire.

PRELIMINARY FINDINGS

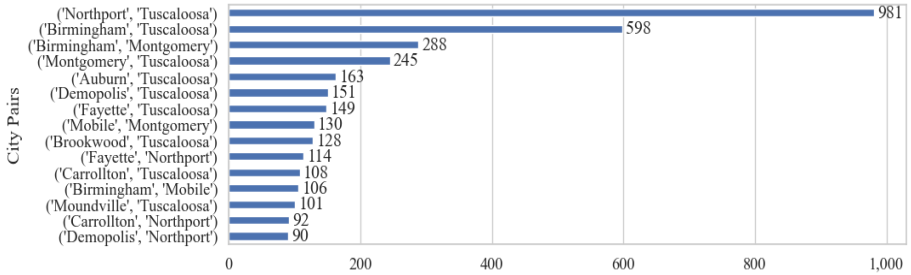

Figure 1. Top 15 most frequently co-mentioned city pairs in Alabama news articles.

Our analysis reveals rich spatial patterns embedded in local news. We extracted 79,310 place mentions, referencing 6,286 unique locations, with the majority (98%) of them located in Alabama, including 351 Alabama cities. More than half of the news (56%) mention at least two locations. In total, the data include 16,963 city pair co-mentions, corresponding to 4,448 unique pairs. We also observed frequent co-mentions with out-of-state cities such as Washington D.C., New York City, and Los Angeles. The resulting co-mentioning network within Alabama comprises 160 nodes and 237 edges, with a network density of 0.02, indicating a sparse structure.

Figure 1 shows the most frequently mentioned pairs, while Figure 2 maps these pairs across Alabama, reflecting underlying spatial, symbolic, and cultural associations. Northport and Tuscaloosa (which are geographically proximate) were co-mentioned most often due to their co-membership in a governance structure. Other prominent pairings included Birmingham–Tuscaloosa, linked by interstate and shared economic infrastructure, and Auburn–Tuscaloosa, whose strong co-mentioning reflected cultural association, particularly in their rivalry in college sports. The overall distribution of co-mention frequencies followed a truncated power law ($\alpha = 2.25$), indicating a few dominant pairings and a long tail of infrequent ones.

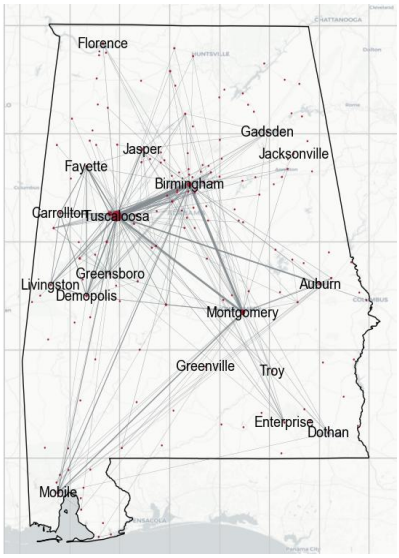

Figure 2. Simplified co-mention network of Alabama cities.

These co-mention patterns were not uniform across categories. While Tuscaloosa (the news operation's headquarter) held the highest degree overall, thematic variation revealed different hubs: Birmingham led in crime-related news, and Montgomery connected to most cities in political and economic news. In sports news, Auburn–Tuscaloosa was the most mentioned pair due to their rivalry. Health news highlights Fayette–Tuscaloosa and Fayette–Northport.

Edge density also varied across categories. Sparse networks in crime, disaster, and education news suggest more localized and fragmented coverage, as these events tend to be confined to specific areas. In contrast, denser networks in politics, health, and sports indicate broader geographic linkages, reflecting issues that span or affect multiple cities. These differences suggest that some themes may reinforce regional connectivity, while others may contribute to the fragmentation of emerging news deserts (or information deserts for time-critical information).

DISCUSSION AND FUTURE WORK

This study presents a novel methodological framework for analyzing spatial narratives in local news by combining LLMs with network analysis of city co-mentions. Beyond indicating geographic proximity, co-mentions reveal meaningful relational ties shaped by socio-political, environmental, and cultural associations. It offers a relational perspective on the geography of local information, highlighting how news re-constructs and connects places. This study opens new avenues for understanding the material dimensions of news (or local information). Our preliminary findings suggest that news deserts or "news capitals" may be defined not only by the volume of local news but also by a place's relational embeddedness in and its symbolic relatedness with other cities in media narratives of events.

Future work will explore how these co-mention patterns evolve over time and in response to specific event types, such as natural disasters, political decisions, or institutional collaborations. We also plan to incorporate data from additional Alabama news stations for comparative analysis and examine the semantic connections alongside geographic connections in news narratives. Through this series of analyses, we hope to uncover the relationship between spatio-temporal aspects of local information, its provision patterns, and their relationships with community outcomes (e.g., civic engagement). We invite further research on how such media-driven spatial networks and their

topological characteristic contribute to local information infrastructures and shape public imaginaries of regional interdependence.

AUTHOR ATTRIBUTION

Jieshu Wang: conceptualization, methodology, data curation, formal analysis, validation, investigation, visualization, writing – original draft; Tugce B. Gundogdu: data curation, validation, writing – original draft, writing – review and editing; Brian S. Butler: conceptualization, resources, writing – original draft, writing – review and editing; Myeong Lee: conceptualization, resources, formal analysis, supervision, investigation, methodology, project administration, writing – original draft, writing – review and editing.

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AnnoLoom: Augmenting Codebook Generation and Annotation with Large Language Models

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ABSTRACT

We introduce AnnoLoom, a tool designed to assist researchers with codebook development, annotation tasks, and evaluation of human vs. AI's annotation results. AnnoLoom contributes to human expert-AI collaboration and its efficacy in the context of using Large Language Models (LLMs) for research involving text-based data. We conducted a cognitive walkthrough to iteratively improve the design of AnnoLoom and discussed the future work.

KEYWORDS

Human-AI Interaction; Human-LLM Co-Annotation; Interactive Data Annotation; Large Language Models

INTRODUCTION

Annotation, "the sense-making practice of a given dataset, where annotators assign meaning to data using (pre-defined) labels (Wang, Prabhat, and Sambasivan 2022)", plays a critical role in machine learning (Monarch 2021; Pustejovsky and Stubbs 2012), qualitative research (Richards 1999; Rietz and Maedche 2021), and practice-based domains (Green 2006; Zheng et al. 2022), uncovering the deeper patterns of data and extracting meaningful insights. Obtaining high-quality labeled data often requires significant time and resources, especially when relying on human experts to perform the annotations (Aghakhani, 2025; Bouzoubaa et al. 2024; Wang et al. 2021, 2024).

LLMs, transformer-based models with hundreds of billions of parameters trained on massive text corpora, demonstrate capacities to understand natural language (Zhao et al. 2023) and show promise in supporting annotation tasks (Gilardi, Alizadeh, and Kubli 2023; Goel et al. 2023). Recent studies suggest that collaborative approaches—where humans annotate LLM-generated labels or where human and LLM annotations are combined (co-annotated)—tend to outperform either human-only or LLM-only methods(Li 2024; Wang et al. 2021). Thus, researchers are increasingly developing human-LLM collaborative annotation systems to enhance the overall quality and efficiency of annotation processes (Kim et al. 2024; Tang, Chang, and Yang 2024).

Building on this work, we present AnnoLoom—a novel tool that leverages LLMs to augment annotation practices. Unlike existing human–LLM co-annotation platforms focusing on a certain stage of annotation, AnnoLoom supports the entire annotation pipeline by integrating codebook creation, dynamic annotation, and results evaluation into a cohesive and flexible workflow, as in Figure 1, enabling iterative refinement at each stage.

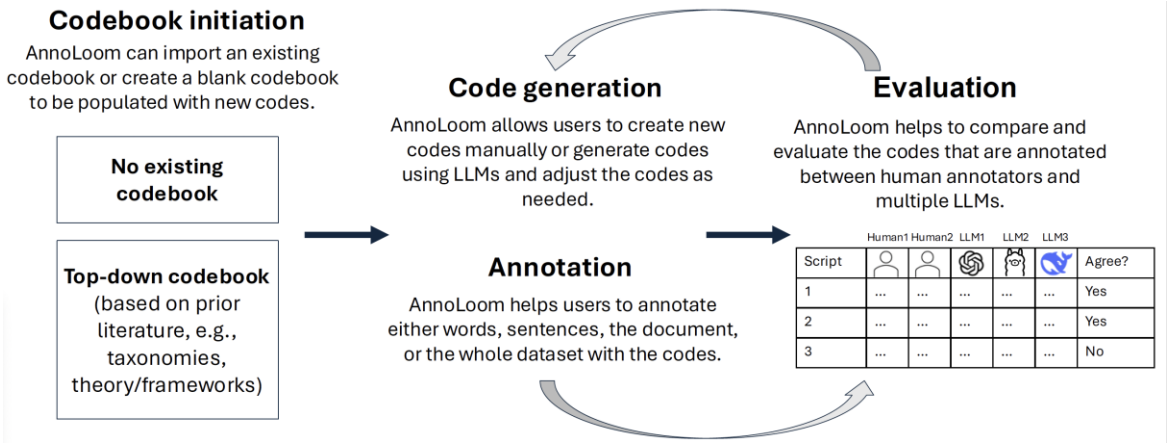

Figure 1. Iterative Workflow of AnnoLoom, from Codebook Initiation to Evaluation

SYSTEM DESIGN

AnnoLoom will be available as both a web-based platform and a standalone application, providing users with seamless, in-platform access to LLMs throughout the annotation process. The system integrates open-sourced and commercial LLMs and allows users to insert their own API keys as needed. When initiating codebook, users can choose a certain LLM for annotation tasks and then import an existing codebook or generate a new one, either manually or with the LLM's assistance. During code generation and annotation, users can apply codes to highlighted text or entire documents. All codes are editable and can be exported for future use beyond AnnoLoom. For evaluation, users can compare results from human annotations and LLM-generated annotations using inter-rater reliability. Visualizations are available to help compare multi-coder results, including those of LLM.

The backend is implemented using Next.js API routes to handle code generation, codebook management, file uploads, and user authentication, and MongoDB for data storage. The database stores (1) structure and metadata of each codebook, including the associated LLM prompt, list of codes, their definitions, and descriptions; (2) metadata and content references for the files uploaded by users, supporting formats such as .txt, .csv, .docx, and .pdf; and (3) information required for user authentication and personalized settings, such as selected LLM models, API keys, and preferences. All users' actions that alter data on the frontend for the codebook and annotations are synchronized with the database to maintain data integrity. A screenshot of the interface is shown in Figure 2.

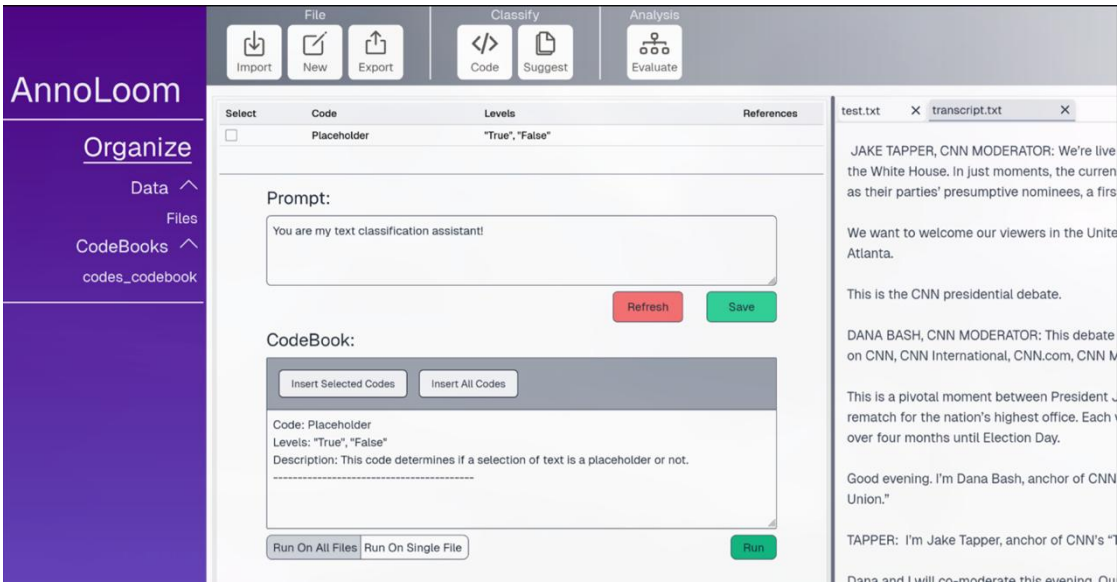

Figure 2. Interface of AnnoLoom for Co-Annotation.

COGNITIVE WALKTHROUGH EVALUATION AND DISCUSSION

We conducted an internal cognitive walkthrough by simulating typical user behavior and identified several usability and functionality issues across the codebook creation, co-annotation, and result evaluation tasks, including (1) the absence of a dedicated codebook creation section, (2) inconsistent terminology, (3) a lack of prompt history tracking, (4) limited visualization and export functions, and (5) insufficient support for collaborative workflows. We improved the demo shown at https://gai-eight.vercel.app. We will conduct user research before releasing AnnoLoom and iteratively improve the design. AnnoLoom supports iterative annotation practice, relying on experts to manage LLM hallucinations. Other solutions may use entropy and confidence values for the uncertainties (Li et al. 2023).

GENERATIVE AI USE

We employed ChatGPT and Grammarly for the following purposes: brainstorming a name for the annotation system, refining the writing to make it concise, and correcting grammar mistakes. We revised the output by iteratively brainstorming and writing. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

Lu Wang: conceptualization, methodology, investigation, formal analysis, writing – original draft; Duncan Lynch: software, investigation, writing – original draft, presenter; Elham Aghakhani, George Demiris, Karla Washington, Rezvaneh Rezapour: conceptualization, writing – review and editing; Jina Huh-Yoo: conceptualization, methodology, supervision, writing – review and editing, project administration, funding acquisition.

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Using Agentic AI to Enhance the Quality of Academic Libraries' Responses for Student Queries

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ABSTRACT
This study examines the application of agentic AI to evaluate the effectiveness, accuracy, and efficiency of academic libraries' responses to student queries. Data were collected by analyzing frequently asked questions (FAQs) from the University of Wisconsin-Milwaukee library website using OpenAI's large language models (LLMs), o4-mini. The analysis focuses on identifying the types of questions that are most appropriate for AI-assisted responses and how agentic AI can support librarians in delivering targeted and timely assistance. The findings reveal that agentic AI can significantly improve the quality of library services by providing more timely and targeted student support. This research aims to enhance the effectiveness of librarian responses, strengthen librarian-student interactions, and support the meaningful integration of agentic AI into academic libraries.

KEYWORDS
Agentic AI, Large Language Models (LLMs), OpenAI o4-mini, Academic libraries, FAQs

INTRODUCTION
As academic libraries adapt to the digital environment, the need for scalable, responsive, and personalized services is growing. Students increasingly sought immediate support on both general and complex questions (Lamøy & Kilvik, 2021). While traditional library services remain valuable, they often struggle to meet real-time demand (Lappalainen & Narayanan, 2023). Large language models (LLMs) offered a promising solution by interpreting natural language, understanding context, and generating relevant responses (Shah et al., 2023; Wang et al., 2024); models such as OpenAI's o4-mini represent a new generation of compact and efficient LLMs designed for real-time interaction and accessible deployment (OpenAI, 2025a). In academic libraries these models can enhance virtual and digital reference services, automate content summarization, and support interactive learning (Ikwuanusi et al., 2023; Saeidnia, 2023; Soto et al., 2024). Their ability to deliver fast, context-aware responses stems from large-scale reinforcement learning (RL) and the integration of chain-of-thought (CoT) reasoning techniques (OpenAI, 2025b). In addition, research also highlighted that AI could bring broader potential in cataloging, classification, information searching, information literacy, indexing, natural language processing, and reference services (Asemi & Asemi, 2018; Cox et al., 2019; Das & Islam, 2021; Huang, 2024; Hussain, 2023; Jha, 2023; Leong, 2024; Mogali, 2014; Wood & Evans, 2018).

"Agentic AI uses sophisticated reasoning and iterative planning to autonomously solve complex, multi-step problems" by "integrating with external tools and software via application programming interfaces, agentic AI can quickly execute tasks based on the plans it has formulated." (Pounds, 2024). As Shavit et al. (2023) noted, "Agentic AI systems are AI systems that can pursue complex goals with limited direct supervision". Unlike the primarily conversational, summarization and on demand assistance roles of most current chatbots in academic libraries (Ehrenpreis & DeLooper, 2022; Verma, 2023), agentic AI introduces capabilities such as multi-agent collaboration, dynamic task decomposition, persistent memory and autonomous orchestration, yet despite its transformative potential remains underexplored in libraries, likely due to inherent complexity, and the need for oversight and institutional trust (Sapkota et al., 2025). Moreover, the adoption of artificial intelligence presents challenges as libraries must safeguard data privacy, guard against algorithmic bias, and reconsider the librarian's role (Cox et al., 2019; Chouia, 2025; Mabona et al., 2024; Michalak, 2023).

Given that the role of agentic AI in supporting detailed student queries remains underexplored, this study examines how agentic AI can improve libraries' responses to student queries and help librarians deliver more effective and directed support. The research questions are as follows: 1) What forms of support can agentic AI provide to help librarians address student queries more effectively? 2) What features of students' questions (e.g., linguistic, structural, or contextual) best enable agentic AI to generate useful, efficient responses in academic library settings?

METHODOLOGY
This study analyzed 74 frequently asked questions (FAQs) and anonymized student queries from the University of Wisconsin-Milwaukee (UWM) library website (2022-2025) to explore opportunities for AI integration. Using OpenAI's o4-mini, questions were semantically analyzed and categorized into three types: (1) ***General_QA*** (n=10), which included general library questions not specific toward UWM; (2) ***School_Specific_with _Fact_Only*** (n=55), which included questions that require UWM-specific knowledge that could be answered with straightforward facts, and without needing additional reasoning or strategic planning; and (3) ***School_Specific_with_AI_ Agent_Potential*** (n=9), which included questions that require UWM-specific knowledge or even internet resources that would benefit

from AI assistance to provide comprehensive answers, such as developing research strategies or creating step-by-step plans using UWM resources. Given the increasing relevance of AI systems in libraries, this study focused exclusively on the ***School_Specific_with_AI_Agent_Potential*** category to better illustrate the full capabilities of AI agents. Figure 1 illustrated how multiple AI agents can jointly handle school-specific and library-related student queries.

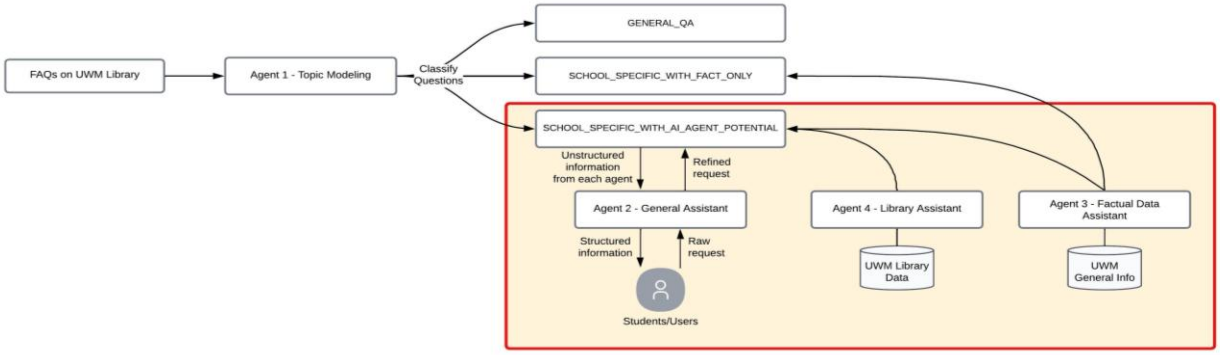

Figure 1. AI agents answering school- and library-specific student queries

RESULTS

For RQ1, the study used a prompt drawn from FAQs of the University of Wisconsin-Milwaukee (UWM) library website: "*Can you help me find autobiographies and biographies for students in grades 1–3?*" This query was first handled by "Agent 2 – General Assistant", which generated follow-up questions to clarify the student's intent. The refined request was then passed to "Agent 4 – Library Assistant", which accessed simulated catalog data to compile a list of relevant materials. Agent 4 also provided transparent reasoning steps to both Agent 2 and the student, which demonstrated how it evaluated and selected appropriate resources. Meanwhile, "Agent 3 – Factual Data Assistant" contributed contextual information, such as library location and contact details. Finally, guided by the reasoning provided by Agents 3 and 4, Agent 2 synthesized their outputs to deliver a comprehensive response, including recommended reading materials and a suggested reading plan. (Note: Agents 3 and 4 currently use simulated data but can be connected to live systems). Overall, with the assistance of agentic AI, librarians can clarify intent, locate and evaluate resources, provide context, and deliver precise, timely responses to students.

For RQ2, the study found that student queries with specific linguistic, structural, and contextual features significantly improved the performance of agentic AI. Queries that clearly stated the subject matter (e.g., "*autobiographies for grades 1–3*") enabled the system to identify relevant resources more accurately. Well-structured sentences allowed the general assistant agent to interpret intent effectively and initiate appropriate follow-up questions. Contextual details (such as intended grade level or use case) further refined the AI's responses by guiding task delegation and resource filtering. Additionally, when student queries implied actionable outcomes (such as generating reading plans or curating resource lists), agents collaborated more efficiently to produce librarian-informed responses. This effect was particularly evident in queries that required a combination of reasoning, execution planning, and access to specialized information, such as school-and-library specific needs. The findings suggested that precise, context-rich queries that invited multi-step reasoning and reflected institutional context were key to unlocking the full potential of agentic AI in academic library environments.

CONCLUSION

This study demonstrates that agentic AI can transform academic libraries by helping librarians deliver precise, targeted support from clarifying students' intent and finding relevant resources to synthesizing recommendations via multi-agent collaboration. Moreover, the effectiveness of these responses is strongly influenced by the structure and content of the student queries. Questions that are specific, well-structured, and context-rich enable agentic AI to deliver librarian-informed assistance with greater accuracy and relevance. However, given the limited use of agentic AI in academic libraries nowadays, future research should explore real-world applications and collaborative system design with librarians to ensure alignment with academic values.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Wang, Ning-Chiao: conceptualization, data curation, formal analysis, methodology, project administration, writing – original draft, review and editing; Chou, Yen-Chen: conceptualization, data curation, methodology, software, formal analysis, writing – review and editing.

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A Holistic Understanding of Chinese Children's Artificial Intelligence Literacy: An Exploratory Study

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ABSTRACT
Artificial intelligence has undergone an iterative evolution from ‘reactive’ to ‘discriminative’ to ‘generative,’ with its penetration into society becoming increasingly widespread. As a result, the cultivation of children's artificial intelligence literacy has become increasingly important. China's unique technological ecosystem, cultural context, and government priorities provide a favorable backdrop for research. However, we know little about the mechanisms and content of AI literacy development among Chinese children. In this exploratory study, we conducted interviews with children from different regions of China through both online and offline methods. Through coding analysis of the interview records, we found that Chinese children develop a series of skills through a bidirectional interaction between ‘cognition and behaviour.’ After independently mastering these skills, children internalize AI literacy. Based on this, Chinese children's AI literacy can be categorized into cognitive-associated literacy, behavioral-associated literacy, and skill-associated literacy. These findings provide insights for establishing a child-centered framework for AI literacy.

KEYWORDS
Children's artificial intelligence literacy; grounded theory; children's perspective; Chinese context

INTRODUCTION
China's Ministry of Education (2025) released ‘Guidelines for Artificial Intelligence Literacy Education in Primary and Secondary Schools (2025 Edition).’ (Basic Education Teaching Guidance Committee of the Ministry of Education of the People's Republic of China, 2025) and the ‘Guidelines for the Use of Generative Artificial Intelligence by Primary and Secondary School Students (2025 Edition) (Basic Education Teaching Guidance Committee of the Ministry of Education of the People's Republic of China, 2025). China's unique tech ecosystem and cultural context offer a non-Western perspective for global AI development. While academia recognizes literacy's core value for digital natives and integrates theories from educational psychology (Zhong & Liu, 2024) and epistemology (Zhang et al., 2024b), building on frameworks like Bloom's Taxonomy (Ng et al., 2023b) and Gagné's learning outcomes (Zhang et al., 2021), limitations persist. First, most studies use a "knowledge-skill" framework, listing components but neglecting AI's dynamic impact on children. Second, frameworks based on "adult imagination" overlook children's agency. Therefore, grounded in literacy's fundamental meaning—"all of these behaviors have to do with effective interaction with the environment, under the general heading of competence" (White, 1959)—this study examines authentic child-AI interaction scenarios in China, asking: How is AI literacy generated and developed among Chinese children? What dimensions does it encompass?

RESEARCH METHODS
This qualitative study adopts grounded theory, a methodology well-suited to emerging fields such as children’s AI literacy, where theoretical frameworks remain underdeveloped—to explore the "why" and "what" of the phenomenon. We recruited 30 children aged 0–18 years, with recruitment procedures strictly adhering to the UN Convention on the Rights of the Child and China’s Minors Protection Law. All participants had prior experience using AI tools and were selected to represent diverse geographical regions; recruitment was conducted through both online and offline channels. Semi-structured interviews, each lasting 40–60 minutes, were used to investigate children’s perceptions of AI, their AI usage behaviors, and their self-assessments of AI literacy. Parental and child consent was obtained for all interviews. Data collection was carried out in three rounds to ensure a balanced distribution of participants across age groups and regions. Interview transcripts were manually coded by the research team, with coding discrepancies resolved through weekly team discussions to ensure consistency. Analysis identified two core categories: "Methods for developing AI literacy of children" and "Contents of AI literacy of children." These core categories encompass five subcategories: influencing factors of literacy formation, dynamic processes of literacy development, cognitive-related literacy, behavior-related literacy, and skill-related literacy (see Fig. 1). Coding six reserved transcripts produced no new concepts, confirming theoretical saturation.

FINDINGS
Children's AI literacy is formed through the interaction of cognition, behavior, and skills. Based on this, the components of children's AI literacy can be divided into cognitive-associated literacy, behavioral-associated literacy, and skill-associated literacy.

Methods for developing AI literacy of children

First, the dynamic interaction between cognition and behavior is the basis for the formation of literacy. Children's AI cognitive characteristics originate from their perception of AI presence, which triggers AI technology adoption behavior, for example, 24-C “I learned from chatting with my classmates that AI can help with writing essays...I usually use AI, mainly for writing Chinese essays”. Through continuous interaction with AI, children revise their views on AI, which in turn guides their technology usage behavior patterns. Second, in the two-way influence of cognition and behavior, children integrate the experiences and skills they have learned to form composite skill areas. Ultimately, through the interaction of these three elements, children develop AI literacy characterized by technological agency, and the feedback pathways of literacy can continuously support changes in the technological environment.

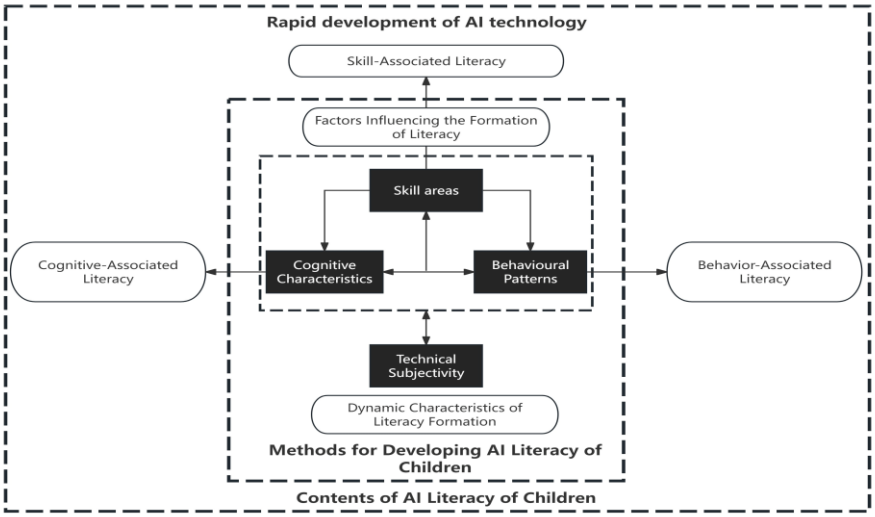

Figure 1. Overall framework for artificial intelligence literacy in China

Contents of AI literacy of children

The cognitive-related literacy, behavior-related literacy, and skill-related literacy proposed in this study refer to the knowledge and abilities that children should possess in the corresponding fields. Cognitive-related literacy includes existence perception literacy, exploration awareness literacy, ontological cognition literacy, functional assessment literacy, future outlook literacy, and risk assessment literacy. In China's practical technology ecosystem, many everyday devices are embedded with simple AI functions, leading children to acquire existential perception literacy from everyday AI applications rather than professional AI applications. Exploratory awareness literacy emphasizes children's agency, as exemplified by 3-C's statement: “I once discovered that Doubao's photo-taking function is very convenient... I also want to continue exploring Doubao.” Ontological cognition literacy refers to children's understanding of the essence and principles of AI, manifested in anthropomorphic cognition and embodied experience. We have expanded future outlook literacy to include functional expectations, technological imagination, emotional needs, and ethical governance. Since most AI products for children in China focus on learning, and Chinese parents place a high value on learning, the emotional needs here refer more to AI's natural language understanding and humanized expression capabilities. Behavior-related literacy includes technology adoption literacy, human-computer collaboration literacy, and behavioral compliance literacy. For example, children are not only able to independently establish human-computer role cognition but also independently set dynamic boundaries for the use of AI on this basis. 24-C mentioned, “After AI generates an essay, I can memorize it and use it, which can improve my test scores.” Skill-related literacy covers tool manipulation literacy, assessment and optimization literacy, and risk prevention literacy. For example, young children will respond to obvious errors through superficial modifications such as adjusting word order and replacing keywords, while older children will respond to hidden errors through in-depth optimization methods such as parameter control and tool switching.

DISCUSSION

This study advances global understanding of children's AI literacy in China by proposing a child-centered "cognition-behavior-skill" framework through grounded theory, reconstructing literacy formation dynamics via children's narratives. It offers practical guidance through differentiated pathways for varying technology exposure levels and advocates multi-stakeholder collaboration for literacy development, while suggesting future exploration of regional differences and inclusive frameworks.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission

AUTHOR ATTRIBUTION

Ping Wang: conceptualization, methodology, investigation, supervision, writing – review and editing; Shiyin Wang: data curation, formal analysis, investigation,validation, writing – original draft preparation, visualization; Hang Su: investigation, validation.

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Development of a Cross-Platform Multi-Scale Instrument for Assessing Usability and Sociability of Queer Online Communities: An Initial Step

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ABSTRACT

Queer online communities across social media platforms serve as critical spaces for LGBTQ individuals to seek and share information. However, few validated tools exist to assess LGBTQ users' experiences in these communities. As part of a dissertation study, this poster presents a cross-platform, LGBTQ-centered multi-scale assessment instrument measuring five key dimensions: ease of use, usefulness, sociability, satisfaction, and continuance intention. Each scale was adapted from existing validated measures and contextualized for information seeking and sharing across popular platforms used by LGBTQ people, including Reddit, Discord, Instagram, and TikTok. Data were collected through an online survey of 92 LGBTQ university students from 44 U.S. higher education institutions. Internal consistency was assessed using Cronbach's alpha and item-total correlations, with results indicating acceptable to strong reliability. The preliminary findings support the instrument's potential for future use in user experience evaluation, inclusive platform design, and LGBTQ information behavior research. Confirmatory factor analysis and construct validity testing are planned for future studies with larger and more diverse samples.

KEYWORDS

Research instrument development, LGBTQ university students, online communities, usability, sociability

INTRODUCTION

Queer online communities across social media platforms play a vital role in supporting LGBTQ people's information seeking and sharing (Adkins et al., 2018; Jia et al., 2024; Yang, 2000). Despite the importance of these communities and a growing body of research on the role of usability and sociability in shaping online interactions (Chen & Qi, 2015; Phang et al., 2009), few studies have systematically assessed how LGBTQ users evaluate their queer online communities across social media platforms. Existing tools rarely address the specific needs and behaviors of LGBTQ users or differentiate among various information practices (e.g., seeking, sharing, avoidance, evaluation, and use). To bridge these gaps, this study proposes an LGBTQ-centered multi-scale assessment instrument measuring five key constructs—ease of use, usefulness, sociability, satisfaction, and continuance intention—for both information seeking and sharing. This poster presents the development process, instrument structure, and preliminary reliability findings.

LITERATURE-INFORMED INSTRUMENT DEVELOPMENT

The cross-platform, LGBTQ-centered multi-scale instrument was developed through a five-step process. First, key constructs—ease of use, usefulness, sociability, satisfaction, and continuance intention—were identified based on prior empirical studies on online communities and information systems (e.g., Fosso Wamba et al., 2017; Riaz & Serani, 2021; Shin, 2013; Venkatesh et al., 2011). Second, relevant items were adapted and contextualized to reflect queer online communities across different social media platforms (e.g., Discord, Reddit) and tailored to both information seeking and information sharing behaviors as two main information behavior types (Makri & Willson, 2025; Savolainen, 2019). Third, each construct was measured using three 7-point Likert-scale items (1 = strongly disagree, 7 = strongly agree), structured in platform-specific blocks for seeking and/or sharing. Fourth, the draft instrument was reviewed by four experts (dissertation committee members) who specialize in research methods and information behavior research. Fifth, the refined instrument was incorporated as the fifth section of an in-depth survey in the quantitative phase of a dissertation study, allowing participants to evaluate usability and sociability of queer online communities across platforms they engaged with while seeking and/or sharing information. Participants completed assessment items only for the platforms they personally used when working on the online survey.

The final five-scale assessment instrument constituted the fifth section of an in-depth questionnaire in the quantitative phase of a dissertation study. Each construct was measured by three items using a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Only one sample item per construct is presented for illustrative purposes due to the limited space in Table 1. Each participant first specified what social media platforms they used queer online communities for information seeking and/or sharing and then used corresponding instruments to assess usability and sociability of queer online communities on social media for information seeking and/or sharing.

Main construct	Sample item	Relevant literature
Ease of use	It does not require much effort to seek information in queer online communities on Discord.	Fosso Wamba et al., 2017; Riaz & Serani, 2021
Usefulness	Queer online communities on Discord enhance my effectiveness in information seeking.	Riaz & Serani, 2021
Sociability	Discord's enables me to meet and socialize with people through queer online communities.	Shin, 2013
Satisfaction	I like seeking information in queer online communities on Discord.	Riaz & Serani, 2021
Continuance intention	I intend to continue using queer online communities on Discord to seek information in the near future.	Lu et al., 2011, Maruping et al., 2017; Venkatesh et al., 2011

Table 1. Representative survey items used to assess LGBTQ students' information seeking experiences in queer online communities on Discord

METHODS

To recruit a diverse national sample of LGBTQ university students, multiple strategies were employed between August 2024 and March 2025. Most importantly, purposeful outreach was conducted to over 200 LGBTQ resource centers and 100 LGBTQ-related student organizations at U.S. colleges and universities. Additionally, the study was promoted with the help of the Consortium of Higher Education LGBT Resource Professionals (https://www.lgbtcampus.org/). Social media (X, Reddit) posts, personal networks, and snowball sampling further helped reach participants. A total of 92 LGBTQ students from 44 higher education institutions across the U.S. completed the online survey. The sample spanned a wide range of institutional types and geographic regions, contributing to the generalizability of the findings. To evaluate the reliability of the cross-platform assessment instrument, Cronbach's alpha values and corrected item-total correlations were calculated for each of the five constructs. Reliability testing was conducted at two levels: pooled data across most frequently used platforms and separate data of individual top platforms in each behavior group (information seeking and information sharing), to provide both overall and platform-specific insights into scale performance.

PRELIMINARY FINDINGS: RELIABILITY AND INTERNAL CONSISTENCY

Among the 92 survey participants, the most frequently used social media platforms for **information seeking** were **Reddit (59)** and **Discord (58)**, followed closely by **Instagram** and **TikTok** (39, tied in usage). For **information sharing**, participants most commonly used **Discord (46)**, followed by **Reddit (35)** and **Instagram (28)**. Given the exploratory nature of this study and the hard-to-reach population, smaller platform-specific subsamples were expected. Nonetheless, all constructs met commonly accepted reliability thresholds. A scale was considered reliable if its alpha exceeded 0.60 and each item showed a corrected item-total correlation above 0.30, following recommendations from prior literature (Field, 2018; Raharjanti et al., 2022; Taber, 2018). In the pooled data, alpha values ranged from 0.70 to 0.90 for information seeking, and 0.66 to 0.83 for information sharing. These results demonstrate acceptable to strong internal consistency. Among the constructs, continuance intention consistently achieved the highest reliability (0.90 in the information seeking group and 0.83 in the information sharing group), while usefulness in the information sharing group had the lowest—but still acceptable—reliability (0.66). These findings confirm that the overall structure of the scale performs well, even with relatively small item sets and varying participant engagement across platforms. Platform-specific analyses showed generally stable reliability, with most constructs achieving alpha values above 0.70. Minor exceptions were observed on Reddit and Discord in the information sharing group, where ease of use and usefulness scales scored in the mid-0.60 range. Importantly, all items across platforms had corrected item-total correlations exceeding 0.30, indicating they contributed meaningfully to their respective scales. These results supported the internal coherence and practical usability of the proposed multi-scale instrument for assessing LGBTQ students' experiences in queer online communities across platforms.

CONCLUSION: CONTRIBUTIONS AND FUTURE RESEARCH

This poster presents an LGBTQ-centered multi-scale instrument designed to assess usability and sociability of queer online communities. Each scale demonstrates strong internal consistency and offers an adaptable tool for future research. Given the exploratory nature of this study and the modest sample size, factor analysis was not conducted. Instead, internal consistency was established using Cronbach's alpha and item-total correlations. Future research with larger and more diverse samples can apply confirmatory factor analysis (CFA) to further examine the validity of the instrument. Additional studies may also focus on community- or platform-specific assessments to inform inclusive platform development and community moderation strategies.

GENERATIVE AI USE

I employed ChatGPT4o for the following purpose(s): Proofread for grammatical errors. I assume all responsibility for the content of this submission.

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This poster presents a portion of the findings from my dissertation research. I sincerely thank my advisors—Dr. Iris Xie, Dr. Dietmar Wolfram, Dr. Jin Zhang, Dr. Tina Du, and Dr. Wonchan Choi—for their invaluable guidance and for reviewing and revising the initial scale questions. I am also deeply grateful to the research participants whose time and contributions made this study possible.

AUTHOR CONTRIBUTION

Shengang Wang: Conceptualization, data curation, formal analysis, investigation, methodology, project administration, writing – original draft, and writing – review and editing.

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Digital (Un)Belonging: Black Trans Men's Information Practices in Marginalizing Sociotechnical Systems

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ABSTRACT

Black trans men experience digital platforms as spaces of both exclusion and possibility. This poster presents a qualitative study in progress, drawing from semi-structured interviews (n=8 to date, with a goal of 12) and a planned Critical Technocultural Discourse Analysis (CTDA) of 12 podcasts, Instagram videos, and YouTube content. Guided by a sociotechnical systems approach, the study examines how Black trans men navigate information practices across intersecting systems of race, gender, and technology. Preliminary findings highlight four emergent themes: intersectionality, epistemic resistance, visibility management, and platform navigation. These early insights illustrate how marginalized users negotiate information ecologies that often render them invisible while simultaneously building infrastructures of care and knowledge.

KEYWORDS

Black trans men; information practices; sociotechnical systems

PROBLEM STATEMENT

Digital platforms reflect and reproduce racialized and cisnormative logics, shaping whose knowledge and identities are recognized. Scholarship in information science, media studies, and STS has examined algorithmic bias (Noble, 2018), racialized harm (Benjamin, 2019), and exclusionary platform design (Brock, 2020). However, these frameworks rarely focus on the experiences of Black trans men. By overlooking this population, research misses how race and gender interact in shaping information access, visibility, and belonging. This study addresses that gap by centering the digital practices of Black trans men as they navigate erasure and enact resistance online.

BACKGROUND

Trans communities have long turned to digital spaces for information, affirmation, and community (Cavalcante, 2016; Haimson et al., 2019). Yet much of this work emphasizes generalized or white trans populations, leaving limited attention to Black trans men's experiences. These men engage digital platforms that simultaneously constrain and enable visibility. Their strategies of curation, selective disclosure, and content creation reflect complex negotiations of identity and safety within systems not designed for them.

METHODS

This qualitative study combines semi-structured interviews with Critical Technocultural Discourse Analysis (CTDA). At this stage, 8 interviews have been conducted, with a goal of 12. Participants include Black trans men, cultural workers, community organizers, and podcasters aged 21–62. Interview questions focused on digital information practices, platform use, and strategies for visibility and care. CTDA will analyze 12 publicly available digital media artifacts cited by participants, including podcasts, Instagram Reels, and YouTube videos. Analysis is guided by codes such as visibility, resistance, affordances, and self-representation. Ethical considerations include informed consent, confidentiality, and respect for participants 'safety.

FINDINGS

Preliminary analysis of eight interviews reveals four early themes, summarized below and illustrated in Table 1.

- Intersectionality: Race, gender, class, and geography shaped digital engagement and interpretation of risks and representation.
- Epistemic Resistance: Content creation and resource-sharing resisted erasure and countered misinformation.
- Visibility Management: Participants curated online presence through selective posting, private accounts, and adaptive strategies.
- Platform Navigation: Users shifted across platforms in response to moderation practices, algorithmic suppression, and safety concerns.

Themes	Quotes
Platform Navigation	"I'm constantly having to filter what I say so the algorithm doesn't hide it—but also so I'm not outed in ways I don't want."
Visibility Management	"I choose what platforms get what parts of me. Twitter/X gets the activist; Instagram gets the artist. Facebook gets nothing."
Community Connection	"My first instinct is to say, shared politics,' but it's beyond party labels—it's more like a shared way of thinking about the world. We must take care of each other because no one else is going to do that."
Information Seeking	"I use Google, FB. I talk with various community members and organizations for some of my information needs. I listened to podcast episodes to figure out my surgery options."
Platform Constraints	"I can't move like other people… Kid Fury can get advertisers, but as soon as we say we're Black and trans, it's controversial."

Table 1. Black Trans Men Information Practices Themes & Quotes

CONCLUSION

Black trans men actively reshape digital information ecologies through practices of resistance, care, and curation. These strategies demonstrate how marginalized communities innovate within sociotechnical systems, building infrastructures that sustain knowledge and belonging. This study expands critical information science by integrating intersectional analysis of race, gender, and technology into the study of digital practices. The preliminary findings offer implications for digital equity, information literacy, and platform design, while pointing toward the need for continued research as additional interviews and media analysis are completed.

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Development of an AI Chatbot for VR Training for Patron Interactions

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ABSTRACT
Public library staff often express feeling unprepared to engage with people experiencing crises that require de-escalation. This poster details the iterative development and refinement of a Generative AI (GenAI) chatbot designed to enhance immersive virtual reality (VR) training simulations for public library staff. Building on previous work exploring VR for de-escalation training, we trace the evolution of our simulated patron—from "Michael 1," a live-roleplayed avatar in Mozilla Hubs, to "Michael 2," an initial GenAI chatbot integrated within the Engage platform, and culminating in "Arthur," a more sophisticated GenAI chatbot being developed in a custom Unity environment using Python, C#, Blender, and various APIs (TTS, STT, LLM). This project focuses on leveraging GenAI to create realistic, interactive practice scenarios, aiming to improve staff confidence, skill development, and ultimately foster more effective, empathetic crisis response in public library settings.

KEYWORDS
Virtual Reality; Generative AI, De-escalation Training; Public Libraries; Simulation-Based Training

INTRODUCTION
Library staff often feel unprepared to handle crises such as emotional distress, mental health issues, or housing insecurity despite their being widely regarded as inclusive, supportive community spaces. These situations push staff beyond traditional service roles and may require specialized de-escalation skills, yet staff frequently report feeling underprepared, even with existing training resources (Williams and Ogden, 2021). Our previous work explored the use of virtual reality (VR) simulations to support training in de-escalation techniques for library workers and graduate students (Williams, et al., 2024). These VR experiences use observational learning, guided practice, and interactive scenarios designed to build confidence in responding to patrons in crisis. Throughout the project, we have tested various methods, including live roleplay and the use of two Generative AI (GenAI) chatbots to simulate real-time conversations and responses. This poster describes the development and iterative refinement of a GenAI-powered chatbot designed to enhance immersive VR simulations used in de-escalation training for public library staff. We focus on the chatbot's role in enabling realistic practice scenarios, supporting skill development, and contributing to more effective, empathetic crisis response in library settings.

LITERATURE REVIEW
Recent scholarship addresses the difficulties staff encounter as they strive to meet the needs of patrons experiencing crises (see Garner, 2023 or Lenstra and D'Arpa, 2019). Being able to practice skills consistently and in realistic contexts is valuable for being able to leverage skills long-term (Williams, et al., 2024). Meanwhile, prior research has demonstrated the growing deployment of avatars, or digital humans, across various applications, where they have shown effectiveness in providing guidance and emotional support (Loveys et al., 2022; Zirar, 2023). Motivated by these findings, this study explores the application of such technologies within library science. Our project has worked to address this need through a VR experience we've refined over the past five years, first using tools like Mozilla Hubs and then moving to Engage and the game engine Unity. This poster highlights the iterative refinement of an avatar in crisis, developed in part from library staff interviews and input from a clinical social worker. Mozilla Hubs is a browser-based, open-source VR platform with customizable 3D spaces, spatial audio, and no downloads. Now community-led, it supports virtual interaction and events. Engage is a professional metaverse platform for enterprise, education, and training, offering VR/AR/MR access, AI tools, and strong security. Unity is a cross-platform engine for 2D, 3D, VR, and AR development, widely used for games, simulations, and industrial applications. Platforms can be developed by using Python, APIs, Unity, C#, and Blender (for creating 3D models) with a GenAI chatbot for the user to interact with. The GenAI chatbot is created by using multiple Application Programming Interface (API)'s, for Text-to-Speech (TTS), Speech-to-Text (STT), Large Language Models (LLMs) to interact with users in the immersive training (Buldu et al.,2024; Izzouzi, L., & Küçüktütüncü, E., 2024; Shrestha et al., 2024).

RESULTS

Michael 1: Live Roleplay

The first iteration of the patron in crisis was Michael, an avatar created using ReadyPlayerMe and used in our training instance in Mozilla Hubs (see Figure 1). The researchers developed a script that an actor followed to play the person in distress. The actor was cued to end the scenario if participants used two or more de-escalation strategies.

Michael 2: Introducing a GenAI Chatbot in a more realistic VR experience

The second series of studies used Engage, an enterprise solution that offered the ability for a user to interact with a GenAI chatbot that was prompt-engineered in collaboration between the research team and a developer from Engage. Benefits of using this approach included 1) longer engagement time with the person in crisis; 2) more realistic interaction with the patron; 3) more autonomy for the learner, as they drove the conversation with the chatbot; and 4) a more realistic library (see Figure 2). Participants in this series of studies found Michael's behavior human-like and at times confusing. This confusion was seen as intentional and part of his character, which made the interaction feel more realistic. One participant mentioned, "*I didn't think that he was AI, until I was like 'oh is this a problem to solve?' … I thought it worked pretty well.*" Another participant explained, "*Yeah,...so he was just confused, didn't know where he was … I focused on that to get him to someone who can clarify what he needs*." Despite the delays Michael's response, participants found the avatar functional and appropriate. As one participant expressed, "*The dialogue was very slow, which is anticipated … he did a very good job of not responding like a robot but like a human who is actually confused.*"

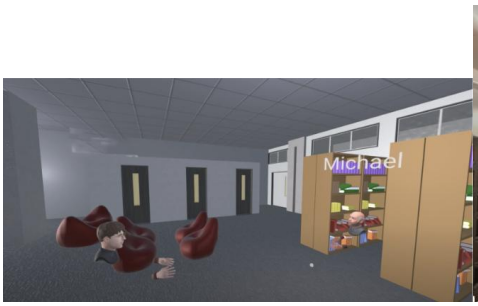

Figure 1. Mozilla Hubs Instance with User Role-playing with Michael 1, Played by Live Actor, and Figure 2. Engage Instance with User Role-playing with Michael 2 Played by GenAI Chatbot.

Arthur

For the most recent development of the training simulation, the research team is building a platform similar to the Engage platform that will be using the tools outlined in a previous section (Python, APIs, Unity, C#, and Blender) with Arthur, a GenAI chatbot for the user to roleplay with. Figure 3 shows Arthur in development in the Unity editor. Figure 4 is the virtual library environment being built using Unity and Blender.

Figure 3. Arthur, GenAI Chatbot, and Figure 4. Draft Virtual Library Environment Built with Unity and Blender.

CONCLUSION

This project addresses the need for effective de-escalation training for library staff through an AI chatbot in VR. We progressed from live roleplay in Mozilla Hubs ("Michael 1") to a GenAI chatbot in Engage ("Michael 2"), and now to a custom, API-driven version ("Arthur") in Unity. Each stage improved realism and learner autonomy. "Arthur," built with Python, Unity, C#, and APIs, offers a flexible, immersive experience to better prepare staff for crisis interactions. This work shows how VR and GenAI can build essential interpersonal skills for public service roles,

such as public library staff. VR headsets will be available for participants interested in interacting with the most updated version of the GenAI chatbot.

GENERATIVE AI USE

Generative AI was not used for this submission.

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Constructing a Domain-Specific Taxonomy by Aligning Multiple Large Language Models' Outputs

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ABSTRACT
Taxonomies organize concepts into broad categories consisting of more specific subcategories. In this study, we explore the use of multiple large language models (LLMs) to construct a domain-specific taxonomy. We propose a five-step workflow that combines LLM prompting, taxonomy alignment, and human validation. To test this workflow, we prompted six state-of-the-art LLMs to generate taxonomies with a maximum of two levels and 30 nodes. Although there were structural and syntactic variations, all models produced coherent taxonomies. Our findings suggest that even in the absence of ground truth data to facilitate taxonomy construction, integrating outputs from multiple LLMs can result in a reasonable starting point for a domain-specific taxonomy. In future work, we plan to complete the remaining steps in our proposed workflow by working with domain experts to verify the combined taxonomies; we will also test the generalizability of this workflow to other domains.

KEYWORDS
taxonomy; taxonomy construction; large language models; artificial intelligence; knowledge organization systems

INTRODUCTION AND RELATED WORK
Hierarchical taxonomies are structures with broad top-level terms, each connected to one or more narrower concepts. These structures are used to organize digital content (Hedden, 2010) and can serve as controlled vocabularies for domain-specific tasks. While manually created taxonomies tend to be of higher quality, building them can be time-consuming (Cui et al., 2024). Although some natural language processing (NLP) research involving taxonomy construction describes successful approaches (Zhang et al., 2018; Zhang et al., 2024), technical complexities make their widespread adoption challenging.

With the advent of generative artificial intelligence (GenAI) technologies, recent studies have considered the potential applications of large language models (LLMs) to taxonomy-related tasks (Chen et al. 2023; Sun et al, 2024). These studies leverage prompt-tuning to improve LLMs' performance, but they do not include domain-specific or human-annotated ground truth data to verify the accuracy of output taxonomies. To address this gap, we build and validate six LLM-based taxonomies through a workflow for specialized taxonomy construction. We ask the following two research questions:

RQ1: How can we leverage the outputs of multiple large language models to construct domain-specific taxonomies?

RQ2: What are the key requirements in a workflow to build domain-specific taxonomies?

We use bridge engineering as a case study to build a specialized taxonomy in this domain. There are no comprehensive vocabularies that one can reference in this domain (i.e., no ground truth data was available). This work-in-progress contributes to the future development of an LLM-driven approach to constructing specialized taxonomies.

METHODS
During February and March 2025, we tested custom prompts using publicly available GenAI chatbots and application programming interfaces (APIs). Following iterative testing, we selected the latest stable versions of six state-of-the-art LLMs for this study: Claude 3.7 Sonnet, Gemini 1.5 Pro, GPT-4o, Llama 3.3 70B Instruct, Mistral Small 3.1, and Qwen2.5-Max. We used promptfoo (Webster et al., 2025) and OpenRouter (https://openrouter.ai/) to programmatically send our prompt to these LLMs. Our final prompt combined one-shot and chain-of-thought prompting techniques (Brown et al., 2020; Wei et al., 2022). The prompt called for a taxonomy of at most 2 levels and 30 nodes for a specific area in bridge engineering: *nondestructive evaluation and structural health monitoring*. The prompt's Background section provided domain-related information. Its Task section described the specific goal and scope of the model's task. The Outputs section explained two expected taxonomy formats with examples of a structured text format for alignment ("Output 1") and the Graphviz format for visualization ("Output 2"). The full prompt can be found in our GitHub repository: https://github.com/ethyoo/Data-for-ASIST-2025

Figure 1 shows this study's proposed five-step workflow for constructing a domain-specific taxonomy. For the taxonomies generated by the six selected models, we attempted a logic-based taxonomy alignment approach (Cheng et al., 2017; Cheng and Dinh, 2025). The approach uses five relations (equivalent, overlap, disjoint, include, included-in) to map concepts in different taxonomies.

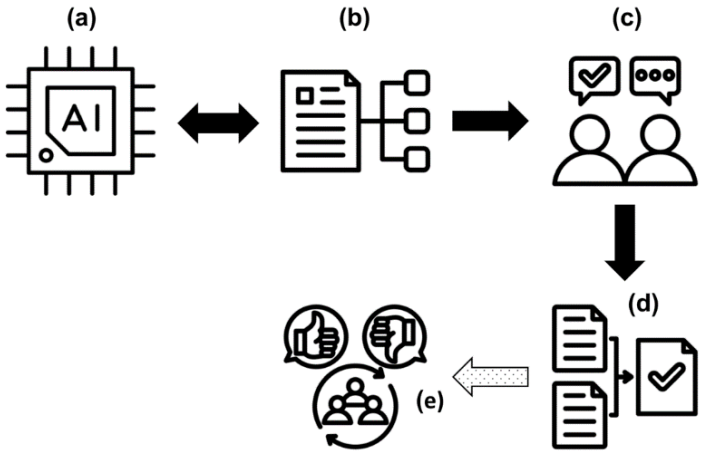

Figure 1. This study's proposed workflow for domain-specific taxonomy construction involves (a) iterative testing of multiple large language models and prompts; (b) generation of multiple taxonomies; (c) verification by information scientists; (d) taxonomy alignment; and (e) validation with domain experts.

RESULTS

Every LLM attempted the full task, but differences in the instruction-following quality (Zeng et al., 2024) were observed in the taxonomies' structures, syntaxes, and semantics. Except for Gemini 1.5 Pro, all models included terms similar or identical to "nondestructive evaluation" and "structural health monitoring" among the taxonomy's parent nodes. For example, Mistral Small 3.1 used only these two concepts as parent nodes. The parent nodes were used to group the technologies, systems, and other related concepts. Other elements of the output varied more widely across the models. GPT was the only model that fully adhered to the instructions, correctly producing both output formats without exceeding the specified maximum of 30 nodes. Gemini and Claude constructed larger taxonomies of 39 nodes and 42 nodes, respectively. Mistral, Llama, and Qwen generated the three smallest taxonomies, which ranged from 16 to 27 nodes. Although these last three models did not correctly produce Output 1, each provided an Output 2 that was both consistent with Output 1 and usable Graphviz syntax.

Our public repository includes a "combined taxonomy", a more comprehensive taxonomy that reconciles synonymous and overlapping concepts, from the taxonomies generated by GPT and Qwen. In our future work, we will align all six of the taxonomies produced by the LLMs.

DISCUSSION AND CONCLUSION

We completed the first four steps of our proposed five-step workflow that combines elements of both an LLM-oriented process and a human-in-the-loop approach. To address RQ1 on leveraging multiple LLMs to construct domain-specific taxonomies, we found shortcomings in the instruction-following capabilities of most models. The LLMs still generally produced structurally acceptable taxonomies. We performed taxonomy alignments to combine these taxonomies as a minimal viable product and validated these outputs for future qualitative inquiry with domain experts. These conversations with domain experts serve as a next step to constructing a final specialized taxonomy.

To address RQ2 on the essential elements of a domain-specific taxonomy construction workflow, we found that LLMs, especially when accessed through unified APIs or user-friendly chatbot interfaces, may make taxonomy construction more accessible than traditional NLP methods. Leveraging multiple LLMs to generate several taxonomies can help mitigate potential errors introduced by any single model. By aligning and combining these outputs, we can further reduce the level of effort required of domain experts asked to interpret and distinguish between specific concepts. We posit, however, that domain-specific taxonomy construction still needs a certain level of human involvement for verifying the output's accuracy. This is especially true for taxonomies with complex domain knowledge and in areas without existing vocabularies to reference.

The limitation of this study lies in the model selection and parameter settings: Although we sought to increase the task's reproducibility through the models' parameters, identical outputs are not guaranteed with LLMs. Repeating the task, even with the same prompt, might reveal changes in the outputs. Adjusting model parameters (e.g., increasing temperature) may also lead to changes in model performance for taxonomy construction.

This study contributes to our understanding of a workflow integrating multiple LLM-generated taxonomies to produce a specialized taxonomy. Our next steps for this project include: (1) working with bridge engineering experts to verify the combined taxonomies; (2) exploring the generalizability of the workflow developed in this study.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

EMY: conceptualization, methodology, software, validation, investigation, writing - original draft, writing - review and editing, visualization; YYC: conceptualization, methodology, validation, investigation, writing - original draft, writing - review and editing, supervision.

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Transforming Perspectives on Data Ethics through Collaborative Game Design

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ABSTRACT
As Artificial Intelligence (AI) advancements create new ethical issues and challenge existing legal regulations, traditional ethical principles and data ethics education often fail to reflect these nuances. This study explores how collaborative game design among students with diverse backgrounds fosters transformative learning in data ethics within a college course. It examines a conversation about motivations for enrolling in the course, pre-course reflections, and post-course reflections from 32 participants in a semester-long credit-based class. Thematic analysis reveals parallels with Mezirow's transformative learning theory (1978) in four key phases of transformative learning. The preliminary findings demonstrate that students not only gained data ethics literacy but also internalized ethical thinking as part of their future goals. This poster highlights the potential of interdisciplinary and collaborative design-based pedagogy to cultivate digital ethical self-awareness and ethical judgements when navigating ethical issues in AI or machine learning (ML).

KEYWORDS
Artificial Intelligence, Data Ethics, Game-design, Transformative Learning, Collaborative Design

INTRODUCTION
Advancements in emerging technologies, particularly AI and ML, are significantly and rapidly transforming society by automating tasks traditionally performed by humans, such as making decisions on their behalf (Bloomfield et al., 2021). AI advancements are creating new ethical issues, challenging existing legal regulations, and redefining cultural and moral values, as the traditional ethical principles fail to keep pace with AI development (Bloomfield et al., 2021). Moreover, there is a "noticeable gap in research efforts concerning pedagogical approaches to teaching and learning AI ethics" (So & Kim, 2024, p.1) as most educational programs predominantly focus on teaching ethical principles as opposed to how to apply these principles in ethical decisions.

In response to these challenges, researchers from three different fields developed a research project that utilized collaborative design as a teaching tool for students, in both technical and non-technical fields, to explore data ethics more deeply. This poster analyzes a subset of project data from the initial study to better understand how participants individually and collectively position their views within data ethics and how these views changed over time with increased exposure to technical concepts and norms. It answers the research question: In what ways does interdisciplinary collaborative game design shape students' awareness of data ethics during a transformative learning experience?

LITERATURE REVIEW
Transformative learning theory, rooted in constructive learning, describes a psycho-cultural process in which individuals revise their interpretations of experiences that challenge existing frames of reference (Mezirow, 1978; 1991). It is composed of four phases—disorienting dilemma, critical reflection, shared meaning-making, and action, which reflects the process by which students "become aware of and challenge their prior assumptions" (Cranton, 2016; Feng et al., 2025; Johnson & Olanoff, 2020, p.739; Mezirow, 2018). Rather than merely gaining new knowledge, transformative learning shifts the "psychological frameworks that shape individuals' self-concepts and relationships" (McCain, 2024, p.21). This poster examines one semester of data from a larger research project designed to explore changes to student understanding of data science ethics through the collaborative design of an educational game (Devasia et al., 2024; Yoon et al., 2024).

METHODS
This study thematically analyzed the transcript of a class meeting and pre-course and post-course reflections from all 32 participants in the Spring 2022 semester. Participants were recruited through purposive sampling and convenience sampling to ensure a diverse range of education levels, areas of study or major, technical skills, and cultural backgrounds (Miles et al., 2024). Students completed a pre-course reflection that asked about their preexisting perceptions of data ethics. In the first whole-class session, students discussed their motivations for participation. At the end of the course, students submitted self-reflection reports that detailed shifts in their

understanding of data ethics. The text of the discussion and the reflections were analyzed using thematic analysis (Clarke & Braun, 2017). Coding was performed using MAXQDA 24 and followed a hybrid approach combining both deductive and inductive methods (Braun & Clarke, 2006).

DISCUSSION

The themes that emerged from the data analysis phase revealed parallels to Mezirow's model of transformative learning (1978). The model consists of four phases that align with the students' perspective changes about data ethics throughout the course.

In the disorienting dilemma phase, students reported experiencing anxiety and skepticism due to their lack of foundational knowledge regarding data ethics in relation to AI/ML. For instance, participant 2 noted, "*I was immediately drawn to DRG for its focus on … simplifying a largely intimidating concept such as data ethics*." This data ethics illiteracy translates into apprehension when they are asked to share personal data on social media. Participant 1 reflected*, "The situation made me feel uneasy because I was worried the person might use my information for malicious purposes."* Recognizing their cognitive and emotional unease, students signed up for this course to resolve their dilemma.

The critical reflection stage involves students beginning to challenge their assumptions, such as a belief that technology is neutral and that ethics is an afterthought when designing algorithmic systems. Participant 5 commented, *"This [course] further solidified the fact that technology is not neutral. It has politics. It can hurt people."* Students come to recognize the human biases embedded in data and algorithms, grasping concepts about data ethics rather than considering them overly complicated. Moreover, students with system design backgrounds changed their views on ethics from an add-on to an integral element of design.

The third stage, shared-meaning making, emerged when students wrote about collaborating in class discussions and group-based game design projects to co-construct ethical thinking. Students reported that small-group discussions helped link the abstract ethical concepts to real-world examples by discussing them with their peers. They also identified remote collaboration tools, such as Slack and Zoom, which fostered their ability to reflect, brainstorm, and collaborate in real-time, despite the online nature of the course. The small group discussion facilitated by online collaboration tools allowed students to build communal knowledge and reconcile dilemmas through dialogue.

Finally, in the action phase, students applied their new ethical understanding into practice through game design and shared their future plans for ethical advocacy. During the second half of the course, students designed an online serious game that embedded data and algorithmic bias, to educate players about data ethics. In framing ethics in designing a game, participant 7 noted, *"we tried not to oversimplify ethical concepts and tried to harness people's familiarity with the basic concepts (such as social media, the internet)."* Furthermore, some students expressed plans to continue advocating data ethics; participant 8 responded, "*For future looking, I would love to share my story and influence other girls in STEM since being a female engineer is a huge part of my identity."* The thematic analysis showed the defining outcome of the final step of transformative learning, which is the integration of new perspectives into students' identities and plans.

CONCLUSION AND FUTURE WORK

Notably, this study was conducted only a few months before the public release of ChatGPT, which increased both the mainstream use of AI products and the importance of conversations surrounding data ethics. Bloomfield et al. (2021) and So and Kim (2024) assert that advances in these evolving fields require AI developers and users to have "digital ethical self-awareness" (Bloomfield et al., 2021, p.3447), an ability to reflect their assumptions and make ethical design decision making and using decision-based on human-centered values and societal impacts of AI. AI and game developers would benefit by collaborating with professionals in non-technical fields to develop this ethical self-awareness. This study provides evidence that self-awareness can be achieved through collaborative design projects that bring together students from diverse backgrounds. Future work could explore how game players from diverse backgrounds expanded their ethical knowledge through playing the prototype developed by engineers and students from non-technical backgrounds.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Sun Yoon: visualization, writing – original draft, validation, resources, methodology, investigation, formal analysis, data curation, conceptualization, software; Sarah Evans: project administration, writing – review & editing, validation, supervision, resources, methodology, investigation, funding acquisition, conceptualization, formal analysis, data curation; Cecilia Argon: project administration, writing – review & editing, validation, supervision, software, resources, funding acquisition, conceptualization, data curation; Bernease Herman: funding acquisition,

project administration, supervision, software, resources, conceptualization, investigation; Liyu Yang: formal analysis, methodology, writing – original draft; Lacy Molina: writing – review & editing. validation, methodology

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A Health Literacy Evaluation of Multimedia Prostate Cancer Information on an eHealth Platform

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ABSTRACT
Prostate cancer patients and caregivers often struggle to find reliable, relevant, and comprehensible health information to guide treatment decisions. To meet their information needs, we developed the Interactive Prostate Cancer Information, Communication, and Support (iPICS) eHealth platform. This study evaluated the understandability, actionability, clarity, and readability of the iPICS education materials supporting users to find, understand, and act upon health information. We sampled our self-curated multimedia materials and applied three validated health literacy instruments: the Patient Education Material Assessment Tool (PEMAT), the Clear Communication Index (CCI), and the Flesch-Kincaid Grade Level (FKGL). Descriptive statistics (e.g., mean, median) summarized assessment scores, and Kruskal-Wallis tests compared scores across material types. Results will guide the ongoing enhancement of iPICS content and user experience, supporting patient education, informed treatment decision-making, and self-care management.

KEYWORDS
Health literacy; Prostate cancer; Patients and caregivers; Health education; eHealth platform

INTRODUCTION
Prostate cancer is the most commonly diagnosed cancer among men in the world and the second leading cause of cancer deaths in the United States (American Cancer Society, n.d.). Due to the complexities of treatment decision-making and survivorship, prostate cancer patients and their families often face unmet information needs (Johnson et al., 2024). Most prostate cancer patients are older and frequently encounter challenges in accessing, retaining, and comprehending health information for symptom management and follow-up care. The Interactive Prostate Cancer Information, Communication, and Support (iPICS) program is an evidence-based, guideline-informed, user-centered eHealth platform designed to support patients and caregivers with useful, credible, accessible health information before, during, and after treatment for localized prostate cancer. The iPICS eHealth platform offers three main components: Inform, Dialog, and Snap. The Inform component serves as a multimedia health information resource hub, integrating the world's largest consumer-grade health information resource, MedlinePlus, via API into the research team's self-curated education materials. The Dialog component offers conversation recording and summarization functions, facilitating patient-physician communication and information retention afterwards. The Snap component provides a moderated online forum that connects patients and caregivers with their peers for communication and support. Through iterative testing and enhancement during its design and development phases (Yu et al., 2023; Yu et al., 2024), the iPICS platform enables users to navigate personalized health information about prostate cancer treatment and survivorship, and empowers them to make informed health decisions.

While MedlinePlus content has been assessed by researchers in several health literacy studies (Lalor et al., 2019; Lopez Ramos et al., 2019), the self-curated patient education materials by the iPICS team, which consists of physicians, nurses, software engineers, and healthcare researchers, have not. This study aims to examine the health literacy levels of these materials. The findings will provide the iPICS research team with evidence-based insights into the information experiences of patients, their families, and caregivers, and guide further improvements of the materials on this eHealth platform.

METHODS
After reviewing the iPICS Inform component's multimedia materials, the research team selected a representative sample of text, audio, and video files across the three major phases of the prostate cancer survivorship journey: before, during, and after treatment. To ensure balanced coverage, we prioritized audio and video resources over textual articles when their content overlapped, as the number of article files is much larger than that of the other two formats. Textual articles were then selected based on the frequency of topic inquiries documented over eight years of our clinical urology practice.

We used three validated health literacy instruments (Mani et al., 2021). The Patient Education Material Assessment Tool (PEMAT) was used to evaluate the understandability and actionability of the materials: PEMAT for Printable Materials (PEMAT-P) was applied to textual articles, while the PEMAT for Audiovisual Materials (PEMAT-A/V)

was applied to audio and video files. The CDC Clear Communication Index (CCI) evaluated the clarity of materials, with the full version (CCI-Full) used for textual articles and a modified version (CCI-Mod) for audio and video files. The Flesch-Kincaid Grade Level (FKGL) scores were calculated to assess the readability of the textual articles.

Two reviewers (LZ and CO) independently scored materials with PEMAT and CCI. Discrepancies were resolved by a third reviewer (FY) through iterative team discussions to reach consensus. FY also generated FKGL scores using Microsoft Word's readability statistics. Data analysis was performed in IBM SPSS Statistics (version 29.0.1) (IBM Corp., 2023). Descriptive statistics summarized assessment scores, including mean, median, minimum, maximum, and frequency. Due to the non-normal distribution of assessment scores, Kruskal-Wallis tests compared scores across material types.

Results

The sample materials included 10 articles, 4 audios, and 5 videos. Articles had a mean length of 591 words with a standard deviation (SD) of 482, a median of 518 words with an interquartile range (IQR) of 420, and a range from 105 to 1701 words. Audios had a mean length of 190.5 seconds (SD = 70), a median of 193.5 seconds (IQR = 104.5), and a range of 115 to 260 seconds. Videos had a mean length of 444 seconds (SD = 427.06), a median length of 252 seconds (IQR = 580), and a range of 43 to 1047 seconds. Table 1 shows the descriptive statistics for understandability, actionability, clarity, and readability. Kruskal-Wallis tests indicated that the understandability, actionability, and clarity scores did not statistically significantly differ across material types ($p > .05$).

Measure	Instrument	# Materials	Mean (SD)	Median (IQR)	Minimum	Maximum
Understandability	PEMAT-P	10	80.51% (±15.92%)	80.77% (±21.47%)	53.85%	100%
	PEMAT-A/V (Audio)	4	85% (±5.77%)	85% (±10%)	80%	90%
	PEMAT-A/V (Video)	5	89.87% (±11.37%)	90.91% (±14.29%)	72.73%	100%
	PEMAT-All	19	83.92% (±13.33)	85.71% (±16.03%)	53.85%	100%
Actionability	PEMAT-P	10	58.00% (±23.94%)	60.00% (±35.00%)	20%	100%
	PEMAT-A/V (Audio)	4	75% (±50%)	100% (±25%)	0%	100%
	PEMAT-A/V (Video)	5	73.33% (±43.46%)	100% (±33.33%)	0%	100%
	PEMAT-All	19	65.61% (± 34.52%)	66.67% (±60%)	0%	100%
Clarity	CCI-Full	10	65.2(±23.55)	68.42 (±27.3)	12.5	89.47
	CCI-Mod (Audio)	4	80 (±28.28)	90 (±30)	40	100
	CCI-Mod (Video)	5	86.33 (±17.18)	90 (±16.67)	58.33	100
	CCI-All	19	73.88 (±23.86)	81.25 (±31.84)	12.5	100
Readability	FKGL	10	8.99 (±4.09)	9.2 (±2.25)	0	16.5

Table 1. Health Literacy Assessment Results

DISCUSSION

Overall, iPICS materials scored exceptionally high on understandability (>80%) (Shoemaker et al., 2013), and audio and video files achieved good actionability (>70%). However, the articles scored fair on actionability due to (1) several articles functioned as resource guides rather than providing direct instructions for taking actions, and (2) a lack of visual aids (e.g., infographics, tables, diagrams). Across three material types, clarity for communication can be improved by emphasizing "one main message," reinforcing quick takeaways with visual cues (Centers for Disease Control and Prevention, 2019). The average readability was at a 9th-grade reading level, slightly exceeding the 6th to 8th-grade recommendation for patient materials by the American Medical Association and the National Institutes of Health (Rooney et al., 2021), highlighting the need for improvement in iPICS' future updates. Based on these results, we will simplify articles to lower reading levels, add visual aids to facilitate comprehension, enlarge fonts for older adults (Yu et al., 2024), evaluate user experience across both self-curated and external content, and explore AI-driven voice and chat assistance to facilitate user interactions with the iPICS content.

CONCLUSION

Using three validated health literacy instruments, this study evaluated the self-curated health information materials developed by the iPICS research team. The findings will inform future enhancements to the self-curated health information content and user experience, supporting patient education for cancer care, and expanding the impact of this eHealth platform on prostate cancer treatment decision-making and self-care management.

GENERATIVE AI USE

We prepared this manuscript in Microsoft Word with a Grammarly plugin, which automatically suggested grammatical corrections, word choices, and sentence structures. Some suggestions were cross-checked with ChatGPT 4o and carefully evaluated before being adopted or discarded. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

First Author: conceptualization, methodology, assessment scoring review, data analysis, writing – original draft; Second Author: assessment scoring, data analysis, writing – review; Third Author: assessment scoring, data analysis, writing – review; Fourth Author: selected the iPICS information materials, writing – review and editing; Fifth Author: conceptualization, writing – review and editing.

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Understanding Generative AI Risks for Youth: An Empirical Taxonomy for Safer Digital Futures

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ABSTRACT
Generative AI is transforming how youth interact with technology, introducing novel risks that are not fully understood by current safety frameworks. This poster presents an empirically grounded taxonomy of risks youth face in interactions with generative AI, based on analysis of 344 chat transcripts, 30,305 Reddit discussions, and 153 real-world AI incident reports. We identify six main risk domains—mental wellbeing, behavioral and social development, toxicity, privacy, bias and discrimination, and misuse or exploitation—encompassing 84 specific risks across four interaction pathways. We highlight GAI-unique risks such as emotional dependency, blurred boundaries between virtual and real life, and harmful GAI-initiated behaviors. Our taxonomy offers a structured foundation for practitioners, educators, and policymakers to recognize and mitigate these emerging threats and bridge critical gaps in existing approaches to youth online safety and AI risk.

KEYWORDS
Generative AI, Youth online safety, Risk taxonomy, AI and children

INTRODUCTION
Generative AI (GAI) rapidly transforming digital experiences for young people. From GA-powered chatbots and virtual friends to creative assistants and educational tools, these systems are now part of everyday life for many children and adolescents. While these technologies provide opportunities for self-expression and support, they also present new risks that are not well understood. Recent incidents and research (Yu et al., 2025) have shown that young users may develop deep emotional attachments to GAI companions, experience exposure to harmful content, or become the targets or agents of harassment using GAI-generated material (Ali et al., 2021; Kurian, 2023). Despite growing concerns, comprehensive empirical frameworks addressing the full spectrum of these youth-specific GAI risks remain scarce. Our current study responds directly to this gap by providing a systematically developed, empirically grounded taxonomy of risks specifically for youth interacting with generative AI.

RELATED WORK
Existing youth online safety frameworks often rely on general models such as the 4Cs of content, contact, conduct, and contract (Livingstone & Staksrud, 2014), guiding studies on cyberbullying, privacy breaches, and exposure to harmful media (Freed et al., 2023). Recent work on AI ethics and safety has examined broader risks including algorithmic bias, toxicity, misinformation, and privacy violations associated with large language models (Ferrer et al., 2021; Gallegos et al., 2024). However, these frameworks largely focus on adults or generalized populations, neglecting the unique experiences and vulnerabilities of youth specifically interacting with generative AI. Emerging research on youth interactions with GAI has started to identify distinct challenges. For example, Ali et al. (2021) documented middle school students' experiences with generative models, emphasizing new social and creative opportunities as well as potential risks. Kurian (2023) explored how AI-driven conversational gaps can negatively affect children's mental health. Andries and Robertson (2023) studied how children misunderstand the emotional boundaries of AI companions. Moreover, Yu et al. (2025) specifically highlighted gaps between parent and child perceptions of GAI risks, finding significant underestimations by parents regarding children's emotional dependency and privacy concerns related to generative AI. Still, a clear empirical taxonomy that systematically maps out the diverse and evolving landscape of youth-specific generative AI risks has yet to be fully established. Our work aims to fill this critical gap by synthesizing insights from online community discussions, real-world incidents, and direct user interactions into a detailed, structured taxonomy that explicitly addresses these emerging GAI-specific youth safety challenges.

METHOD
To build a comprehensive taxonomy of risks, we analyzed three empirical sources. The first source was a large-scale collection of Reddit posts and comments from youth-oriented and AI-related communities. We gathered more than thirty thousand posts that described young people’s interactions with generative AI, searching both for explicit age markers and for parent or guardian perspectives. The second source was a set of incident reports drawn from public AI risk repositories. We identified over one hundred fifty incidents where youth were involved as victims,

bystanders, or users of generative AI. The third source was a dataset of chat transcripts collected from interviews with youth participants in the United States. These included more than three hundred transcripts covering a range of platforms from character-driven chatbots to productivity tools. Three researchers independently coded a subset of each dataset, then met to reconcile codes and refine the taxonomy in a collaborative and iterative process. We calculated Cohen's kappa for the initial 20% samples across datasets, achieving strong inter-rater reliability at 0.83. All identifying information was removed to protect privacy and the study protocol was approved by an institutional review board.

RESULTS

The analysis produced the first taxonomy of risk for youth using generative AI with six principal domains (the full interactive taxonomy is publicly accessible here). The first domain concerns mental wellbeing, including risks of emotional dependence on AI companions and inappropriate responses to mental health disclosures. The second domain relates to behavioral and social development, including blurred boundaries between real and virtual relationships and challenges in learning healthy social norms. The third domain involves toxicity, where youth may encounter or be exposed to offensive, violent, or explicit content generated by AI. The fourth domain addresses privacy, including risks of unintentional sharing of personal information or AI-enabled exposure of sensitive data. The fifth domain captures bias and discrimination, such as the reinforcement of stereotypes or generation of hateful speech by AI. The sixth domain involves misuse and exploitation, where AI is used to create or spread harmful material or to facilitate harassment. Across these domains we identified 84 specific risk types, which are often linked and may evolve along four main pathways: *Escalating Mutual Harm* (prolonged interactions that reinforce harmful behaviors), *GAI-Facilitated Intrapersonal Harm* (AI responses amplifying users' self-directed risks), *GAI-Facilitated Interpersonal Harm* (use of GAI to harm others), and *Autonomous GAI Harm* (risks arising from AI's independent actions, such as biased outputs or unsolicited toxic content). Some risks develop through escalating interactions between youth and AI, while others emerge from one-sided harm either facilitated by the user or by the AI system itself. Our taxonomy also reveals patterns that are unique to generative AI. For example, some young users described forming parasocial bonds with AI companions, sometimes experiencing distress when the system became unavailable or changed behavior. Others described how AI chatbots initiated interactions that crossed boundaries of consent or normalized inappropriate social dynamics. In some cases, youth exploited generative AI to create and distribute harmful content about their peers. These scenarios illustrate how generative AI is creating new kinds of risks that require tailored strategies for detection and intervention.

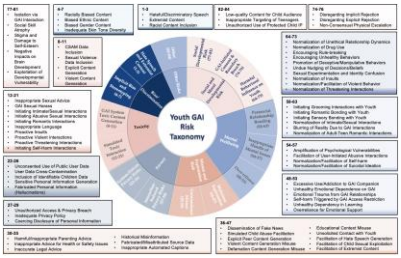

Figure 1. Overview of the Youth-AI Risk Taxonomy

DISCUSSION

The findings of this study highlight the need to rethink approaches to youth safety in digital environments where GAI plays a central role. While many risks have parallels in earlier online safety literature, the adaptive, persistent, and creative nature of GAI systems introduce new complexities (Ali et al., 2021; Gallegos et al., 2024). For GAI developers, our taxonomy suggests the value of monitoring not only for explicit harmful content but also for subtle patterns of emotional engagement, repeated exposure, and role-play dynamics. For educators and caregivers, the results provide language and structure for digital literacy efforts that move beyond simple warnings to nuanced conversations about trust, privacy, and social boundaries (Freed et al., 2023). For policymakers, an empirical taxonomy can serve as a foundation for standards and regulations that reflect the lived realities of youth in GAI mediated spaces. As GAI technologies continue to evolve and reach broader audiences, systematic and evidence based understanding of risks is essential to ensure that these systems serve the interests and wellbeing of the next generation.

CONCLUSION

This work introduces an empirically grounded taxonomy that systematically maps the risks young people face when engaging in generative AI technologies. Drawing on diverse real-world data, including chat transcripts, online community discussions, and public AI incident reports, we identified and organized eighty-four distinct risk types across six principal domains. Unlike previous frameworks that are often theoretical or based on traditional technologies, our taxonomy reflects the realities of contemporary GAI-powered interactions and highlights new risk patterns such as emotional dependence on GAI companions and boundary violations arising from adaptive role-play. The unique contribution of this study lies in providing a detailed, evidence-based structure for understanding youth specific risks in GAI environments. Readers will gain an actionable framework for risk identification, assessment, and mitigation, relevant to researchers, designers, educators, and policymakers. By clarifying the distinct ways that GAI can impact young users, this work aims to guide future research, responsible technology design, and policy decisions toward safer and more supportive digital spaces for the next generation.

GENERATIVE AI USE

Generative AI was used to assist with literature review synthesis and language refinement. All analysis and interpretation were made by the authors.

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Will Book Marketing Editors Lose Their Jobs? A Study on Semantic Variations in Book Advertisement Texts by Chinese Large Language Models

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ABSTRACT
In China, the influence of large language models (LLMs) in text creation has been growing rapidly. However, some of them may not reach users' expectations. Taking China's publishing industry as an entry point, this study systematically explores the practical application of LLMs. Four of China's well-known LLMs were selected. The dataset was constructed by collecting the advertising texts of the top 100 books on the 2024 sales ranking of *Dangdang.com* (Top1 book-selling platform in China), followed by data annotation by two publishing majors' postgraduates. The study reveals that China's LLMs have shortcomings in capturing the core selling points of books and identifying users' pain points, as well as inaccuracies in text emotion analysis and linguistic style. This study proposes optimization strategies that incorporate the ***Pain Point–Selling Point–Solution–Evidence*** logic framework into prompt engineering, along with fine-tuning the model with emotional vocabulary data.

KEYWORDS
large language models (LLMs), semantic variations, book advertisement texts,prompt engineering

INTRODUCTION
In recent years, China has actively promoted the application of artificial intelligence (AI) across various industries. In 2022, the government introduced specific policies aimed at accelerating the deep integration of AI with the real economy (Ministry of Science and Technology et al., 2022). Among them, AI in the publishing industry has also raised attention. With the rapid evolution of LLM capabilities, explorations are emerging especially in semantic understanding, natural language generation (Raiaan et al., 2024), and human-AI collaboration by prompts(Li et al., 2023; Lin, 2024). Discussions have emerged regarding the potential replacement of human book editors or authors by AI systems(Marco et al., 2024). Studies exploring LLMs in the publishing industry tend to focus on their overarching impact on the sector(Song et al., 2023), while they overlook micro-level dimensions like text generation and data processing. This raises a critical question: To what extent can the semantic understanding of Chinese large language models genuinely approximate—or even replace—that of human editors? Specifically, this study addresses the following research questions: (1) How well do different Chinese LLMs comprehend the semantics of book advertisement texts? (2) Which Chinese LLM demonstrates a relative advantage in generating effective book advertisement texts? (3) How can the use of Chinese LLMs be optimized for creating book advertisement texts?

RESEARCH METHODOLOGY
The full dataset for this study was drawn from the promotional texts of the top 100 bestselling books (Fiction: 67, Nonfiction: 33) on the e-commerce platform *Dangdang.com* in 2024. These data avoid seasonal issues and reflect the effectiveness of marketing. Before the study, a random subset comprising 30% of the dataset was selected for manual annotation to verify the agreement. Two researchers (publishing major postgraduate students) independently conducted data coding, and the Holsti reliability test got 0.87, indicating a high level of agreement. This study employed four Chinese LLMs with high rankings in international evaluation benchmarks(Open Compass, 2025)—Doubao-1.5Pro, DeepSeek-V3, Qwen-3, and ERNIE Bot-4.5—as annotation subjects, and included GPT-4.1 mini as a comparative reference for semantic understanding performance. Steps are as follows.

Development of Annotation Guidelines
Based on the 4Ps Marketing Theory (Product, Price, Place, Promotion) (McCarthy, 1960) and the STP (Segmentation, Targeting, Positioning) (Kotler, 1956) commonly used in marketing theory, the study constructed a preliminary data annotation guideline. It was independently evaluated by three senior book editors in China's publishing industry. All dimension scores exceeded 4 out of 5, indicating strong content validity. The guideline was revised based on experts' feedback, resulting in the finalized annotation guideline (Table 1).

Primary Dimension	Secondary Dimension	Definition
Product Value	Core Selling Points	Key information that highlights the unique value of the book
	Value Communication	The logical chain from user pain points to proposed solutions
Reader Sentiment	Audience Targeting	Quantifiable demographic labels
	Psychological Needs	Readers' underlying motivations

Communication Style	Language Style	Overall tone and style of language expression
	Channel Adaptation	The characteristics of e-commerce platforms
Marketing Strategy	Pricing Strategy	Promotional information related to pricing
	Authority Endorsement	Third-party credibility and endorsement

Table 1. Annotation Guideline

Data Annotation

The annotation guideline was input into the five LLMs separately. Each model was first prompted to understand and learn the annotation framework, followed by the input of the full dataset, requiring the models to annotate the book advertisement texts accordingly. **Prompts:** You are a professional text annotation assistant. Please annotate the input book marketing copy sentence by sentence according to the *Guidelines* I provide. When annotating, you must strictly follow the rules in the guidelines to ensure accuracy and consistency.

Manual Evaluation

After collecting the annotation results generated by the models, two researchers independently evaluated the outputs based on the following aspects: (1)Semantic Accuracy (1-10 points): Measures how accurately the model's annotations reflect the semantic content of the original advertisement text. (Kuosa & Aalto, 2025) A higher score indicates a closer semantic match between the annotation and the original text. (2)Label Completeness (1-10 points): Assesses whether the model captured the full range of relevant annotation dimensions. A higher score suggests a more comprehensive understanding of the text by the model. Two raters independently annotated and scored each sample, after which discrepancies were resolved through discussion to reach consensus.

RESULT

We found that Chinese original LLMs significantly outperform non-Chinese original models in Chinese semantic understanding. **In terms of semantic accuracy**, Doubao-1.5Pro and Qwen-3 scored 6.90 and 6.80, respectively, outperforming DeepSeek-V3 (6.35) and ERNIE Bot-4.5 (5.98). **For label completeness,** DeepSeek-V3 achieved the highest score of 7.05, demonstrating a superior ability to capture diverse annotation dimensions compared to the other models. Overall, the differences in semantic comprehension among Doubao-1.5Pro (6.78), Qwen-3 (6.71), and DeepSeek-V3 (6.70) were relatively small, while ERNIE Bot-4.5 lagged behind with a lower overall performance score of 5.79.

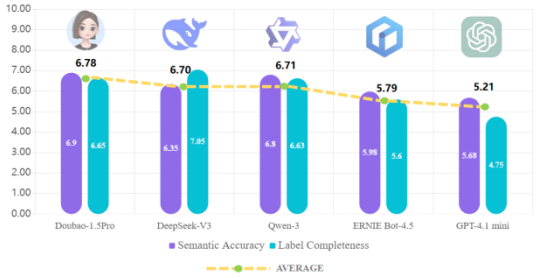

Figure 1. The Result of This Study

CONCLUSION

Although the study confirms that Chinese LLMs demonstrate relatively strong semantic understanding of book advertisement texts, there remains significant room for improvement. The main issues are as follows:

1. Insufficient Abstraction Ability—Inaccurate Identification of Selling Points and Users' Pain Points

While most LLMs were able to extract the selling points in the advertisement texts, they often misidentified general book summaries as the core value propositions. Moreover, when labeling under the Value Communication dimension, many models failed to capture user pain points accurately(Sun & An, 2025). This result suggests that current LLMs lack a nuanced understanding of readers' core needs and exhibit weak text abstraction abilities.

2. Inadequate Emotional Perception—Inaccurate Judgment of Sentiment and Language Style

When summarizing the emotional tone and language style of the texts, the models could generally capture the surface-level sentiment. However, they failed to link these sentiments to broader social or cultural contexts, resulting in inaccuracies in audience targeting and labeling of deeper reader motivations. This indicates a limited capacity for emotional connectivity and contextual sentiment analysis in current models.

In response to the above findings, the following solutions are proposed: (1) **Develop Targeted Prompt Engineering:** Incorporate key user pain points and book selling points into prompt design. Structure prompts around a logical framework of ***Pain Point–Selling Point–Solution–Evidence*** to guide the model's understanding effectively. (Verified, advertisement texts generated using this logical framework as prompt engineering output have scored above 8 points by researchers in this study.) (2) **Fine-tune LLMs:** Build a dedicated dataset of book marketing texts to fine-tune LLMs, enabling better alignment with the emotional tone and stylistic conventions of the publishing industry. For example, categorize texts with different emotions, and introduce variables such as social sentiment, to make targeted adjustments to the model.

As the sample is drawn from bestselling book advertisements in the commercial publishing sector, findings may be more applicable to genres with strong consumer orientation (e.g., self-help, fiction, parenting). Further research is needed to test model performance on academic publishing content.

GENERATIVE AI USE

We employed generative AI tool for the following purpose: Data Annotation. We evaluated the output by rating. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

Xihua Zhai: conceptualization, methodology, data curation, formal analysis, writing – original draft; Xiaoyue Zhang: project administration, writing – review and editing; Yiwei Li: data curation, visualization, writing – review and editing.

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Designers as Co-Creators: Reconfiguring Workflows and Creative Agency in AI-Augmented Design

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ABSTRACT
This study investigates professional designers' integration of AI tools within workflows across five key stages: *Discovery, Ideation, Development, Refinement, and Finalization*. Semi-structured interviews with 14 designers reveal varied AI engagement, shaped by creative intent, identity, and AI trust. A heatmap illustrates AI supporting efficiency and creative tasks (such as ideation, content generation, refinement), while interpretive tasks requiring contextual judgment remain under human control. Designers viewed AI as an assistive co-creator accelerating iteration and automating labor, rather than replacing core creativity. Offloading procedural tasks and early ideation to AI enabled deeper focus on conceptual and critical decisions. Designers used creative agency to reconfigure workflows, fostering reflective, conceptual work. Findings suggest further exploration of human-AI interaction, on how designers balance human-centered values and creative performance, maintaining agency and ethics.

KEYWORDS
Artificial Intelligence; Human–AI Interaction; Design Workflows; Qualitative Methods; Human-Centered Creativity

INTRODUCTION
Artificial intelligence (AI) technologies, including text- and image- based generative AI tools (e.g., ChatGPT, Midjourney), have made a profound impact on design professionals, blurring boundaries across various design disciplines and reshaping how creative work is ideated, executed, and evaluated (Sun et al., n.d.; Lubars & Tan, 2023; Dong & Wang, 2025; van der Maden et al., 2025). While prior research highlights AI's utility in more repetitive, structured design tasks (Botyarov & Gallegos, 2024; Sun et al., n.d.), less is known how AI is integrated into human-centered design, particularly in day-to-day tasks where designers adapt to AI-driven tools (van der Maden et al., 2025; Popova, 2023). Questions remain as to how designers navigate their tasks while incorporating interpretive, conceptual, and ethical dimensions of design (Constantinescu et al., 2021; Fares, 2025; van der Maden et al., 2025). Some highlight AI's positive impact, as early adoption of these technologies have been reported to increase creativity and productivity (Varanasi et al., 2025). Others draw attention to concerns about its content-generating capabilities impacting the overall workflow and professional identity (Varanasi, 2025). As emerging AI tools reshape design work, further research is needed to examine how designers navigate this change. Thus, we address the following research question: How do designers integrate AI tools into their design process, and how do these human-AI interactions impact creative agency and reconfigure workflows?

This study explores professional designers' AI use across key design stages. While nuanced, design processes guide creative practices. Informed by design thinking (e.g., IDEO, 2009; Banse, 2021) and Human-Computer Interaction (e.g., Denning, 2013), design is broadly understood as a human-centered (IDEO, 2009), iterative problem-solving process (Interaction Design Foundation, 2025; Wegener and Cash, 2020)—one that uncovers user needs and assumptions and translates insights into innovative solutions (Interaction Design Foundation, Dam and Teo, 2022; IDEO, early 2000s). Design work conceptualizes, develops, and refines artifacts, systems, and experiences that address identified needs (Interaction Design Foundation, 2025). This study investigates how designers exercise creative agency across stages of design while incorporating AI technologies. It contributes to ongoing discussions on automation, creativity, and the evolving nature of creative roles (Popova, 2023; Sun et al., n.d.).

PRIOR WORK
As AI becomes embedded in creative work, studies have explored its influence on design workflows and ethical challenges. Research highlights AI's potential to enhance ideation, efficiency, and user-centered personalization while questioning authorship and bias (Karnatak et al., 2025; Fares, 2025; Sun et al., n.d.). These tools often act as co-creators, prompting reflection on how creative intent is distributed between human and machine (Deng et al., 2025; Avlonitou & Papadaki, 2025). Emerging work shows how AI reconfigures design workflows and enables hybrid authorship through nuanced human-AI interaction (Dong & Wang, 2025; Popova, 2023). Designers use AI across four phases of design–e.g., Discover, Define, Develop, Deliver–-especially to assist with solution generation in Delivery stage (Lee et al., 2025). They seek to preserve emotional resonance, cultural context, and originality (Avlonitou & Papadaki, 2025; Prajapati, 2025). Writing professionals employ various strategies to proactively maintain their roles–safeguarding against AI, enhancing creative workflows, and resisting AI-enabled automation (Varanasi et al., 2025). While studies have examined these dynamics, often via hypothetical scenarios, deeper empirical study of everyday design practice is needed (van der Maden et al., 2025). Our study addresses this gap by

examining how designers across different domains integrate AI into different workflow stages and exercise creative and ethical agency in navigating complex and evolving design processes.

METHODOLOGY

We conducted semi-structured interviews with 14 participants. Their roles spanned product design (n=3), user experience and user interface (UX/UI) design (n=3), graphic/visual design (n=2), marketing/brand design (n=2), and other roles (n=4) (e.g., hybrid designer, creative technologist). Purposeful sampling was used to capture diverse roles (Patton, 2002). Working across freelance, startups, and corporate settings, all used AI tools for work (e.g., ChatGPT, Figma AI). Interview questions focused on AI tool integration in workflow and creative practices, reflecting on their use across five design stages, adapted from design thinking models (e.g., Brown, 2009; Lee et al., 2025): *Discovery*, *Ideation*, *Development*, *Refinement*, and *Finalization* (See Fig1). Conducted in English or Mandarin, each interview lasted 30-45 minutes and was transcribed for thematic analysis through inductive coding strategies (Gibbs, 2007; Braun & Clarke, 2006). They also estimated AI support (0-100%) across five stages, which formed the analytical framework for how we applied inductive coding directly from the data.

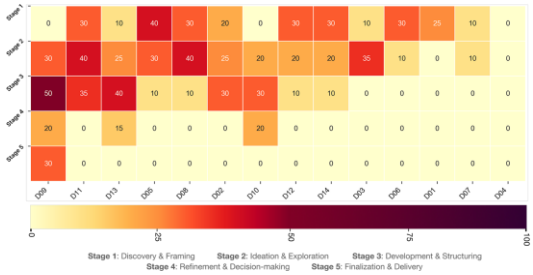

Figure 1. Heatmap of AI tool support across design stages

FINDINGS

AI use was concentrated in the early stages (Stages 1-3: *Discovery*, *Ideation*, *Development*) where outputs generally serve as initial drafts requiring substantial human editing. Usage peaked in Stage 2 (*Ideation*), with an average AI contribution of approximately 21.8%. Across these early phases, designers employed AI for diverse tasks such as research analysis, drafting initial ideas, generating visual or text content, and enhancing efficiency in coding and asset creation (e.g., via Photoshop's AI features). Sophie (graphic design) said: "*It empowers me as the solo designer. The AI can kind of do that for you—make the multiple iterations that you need and generate ideas—so you don't need to be slowed down by working with someone else.*" However, designers showed low trust in AI for core problem framing and found it impractical for inherently physical or coordination-intensive work.

AI engagement significantly declined in later stages (Stage 4-5: *Refinement*, *Finalization*). Participants described the reason as AI's inability to handle nuance, emotional tone, and critical stakeholder-facing materials. They often reserved aesthetic and final decision-making for themselves. Kevin (UX design) said: "*To be honest, I wouldn't trust AI to handle anything without human supervision, whether it's visuals or synthesizing research. Especially in the later stages, I tread carefully. I don't want to be known as someone who creates mediocre work.*" The few instances of AI use in these late stages included minor tasks like visual cleanup or, for one designer, backend code structuring.

Overall, designers managed and monitored their creative agency when using AI, leveraging it for efficiency while ensuring that interpretive, aesthetic, and communicative judgments stay under human control. Leo (UI/UX design) described using Midjourney to generate numerous initial concepts but emphasized that the final design was a unique synthesis the team created manually, demonstrating AI's role as a catalyst for ideation rather than a final author.

DISCUSSION AND FUTURE WORK

Our initial findings suggest that designers adopt AI in selective, stage-specific ways, expressing confidence navigating augmentation, creative agency, and design decision-making. Rather than applying AI uniformly, participants appeared to use it to augment their creative processes while maintaining critical awareness. Patterns of AI use across design stages may vary (Lee et al., 2025), depending on designers' selective or combined use of text- and image-based tools (e.g., ChatGPT for ideation, Midjourney for design solutions), and intended purposes (e.g., user persona generation, concept generation, automated evaluation). We included all AI tools to observe how designers navigated their use, showing how designers strategically negotiate between human intuition and AI affordances. While appearing confident in using AI purposefully, they emphasized the continued importance of human judgment in interpretive, aesthetic, and communicative decisions. These findings align with recent work highlighting how professionals preserve human potential in creative tasks (Varanasi et al., 2025 and suggest designers may benefit from adopting a co-creative mindset, developing competencies in strategic use and ethical evaluation to maintain their core value. Future research can examine how ongoing integration of AI reconfigures designer competence, ethical responsibility, and creative labor across evolving design roles.

GENERATIVE AI USE

We employed GPT and Gemini for the following purpose(s): optimizing grammar and refining text, generating code for data analysis charts, and assisting with literature review. We evaluated the output by comparing it with existing literature for verification, followed by manual review and modification by the authors.

ACKNOWLEDGMENTS

This research was supported by the USC Jimmy Iovine and Andre Young Academy. We would also like to thank a group of students for their assistance in data collection as part of a course project. Finally, we are grateful for the insightful feedback provided by the anonymous reviewers, which helped improve the quality of this paper.

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Humanities-in-the-Loop: Using Close Reading as a Method for Retrieval-Augmented Generation (RAG)

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ABSTRACT
This paper proposes Humanities-in-the-Loop, a methodological framework that embeds close reading into each stage of the Retrieval-Augmented Generation (RAG) pipeline to enhance the processing of digital archival materials. This framework includes manual annotation, knowledge maintenance, reviewer validation, prompt engineering, answer evaluation and human interpretation. Taking the diaries of Coching Chu as a case study, the system addresses the limitations of conventional RAG methods in capturing the contextual complexity and historical nuance inherent in personal archives. The proposed framework not only enhances answer accuracy and interpretability but also enables traceable, human-centered inquiry in digital humanities research.

KEYWORDS
Close Reading; Retrieval-Augmented Generation (RAG); Digital Humanities, Digital Archives

INTRODUCTION
Retrieval-Augmented Generation (RAG) is a hybrid architecture that combines information retrieval with text generation. In a typical RAG pipeline, a user's query is first encoded and compared against a large corpus using a vector similarity algorithm. Relevant passages are then retrieved and passed to a large language model (LLM), which synthesizes an answer based on the retrieved content (DeBellis, et al., 2025). RAG exemplifies what Franco Moretti (2000) termed “distant reading”, a methodology that prioritizes macro-level textual patterns over micro-level interpretive detail. RAG systems rely on computational algorithms to extract semantically related fragments from massive textual corpora. In the field of digital archives, while distant reading methods supported by RAG provide breadth, they often lack the contextual sensitivity and critical nuance necessary to engage with complex archival texts (Sun, et al., 2024; Fu, et al., 2025). As such, there is a growing need to design systems that embed close reading into the RAG pipeline (Bonfiglioli & Nanni, 2015). Hence, this study proposes the integration of "Humanities-in-the-Loop" to restore the importance of close reading within the context of archival research.

METHODOLOGY
Figure 1 illustrates the Humanities-in-the-Loop architecture developed for RAG. It integrates humanistic expertise into each stage of the RAG pipeline.

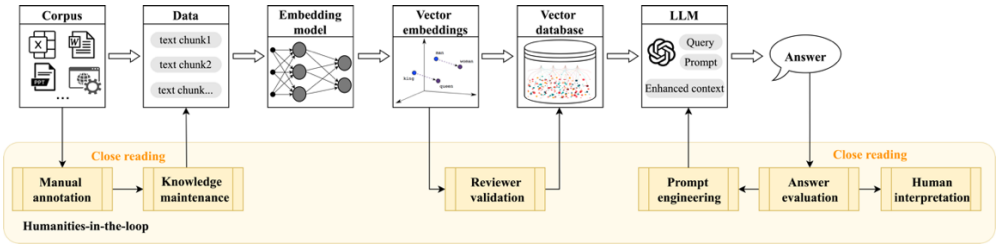

Figure 1. The Humanities-in-the-Loop Architecture

Firstly, this study chooses the diaries of Coching Chu, a 20th-century Chinese meteorologist, as data sources that have been digitized and publicly accessible. Chu has been keeping a diary almost every day from January 1, 1936, to February 6, 1974. More importantly, the knowledge embedded in these diaries consists largely of nuanced, context-rich information that general-purpose LLMs typically lack. This study treats one diary as a document and divides it into chunks by paragraph. **Secondly**, human experts apply close reading to annotate texts with semantic precision, which enables the detailed annotation of entities (e.g., persons, institutions, locations) and relationships (e.g., affiliations, collaborations). Then they maintain and update the knowledge base, including controlled vocabularies, metadata, ontologies, and knowledge graphs to ensure terminological consistency and support context-aware vocabulary alignment. Based on this, the ontological schema is proposed and then systematically stored in the knowledge graph, as is shown in Figure 2. The triples of text chunks are formatted as “Document-hasText-Text chunk1”. The triples of supplemented entities are formatted as “Entity1-Relation-Entity2”. In this study, diary entries by Coching Chu related to Zhejiang University and the Institute of Meteorology were selected and annotated, resulting in a total of 48,455 triples. The generated text strings are then embedded into high-dimensional vectors using the “m3e-large” and the resulting vectors are stored alongside their original triples in the FAISS library.

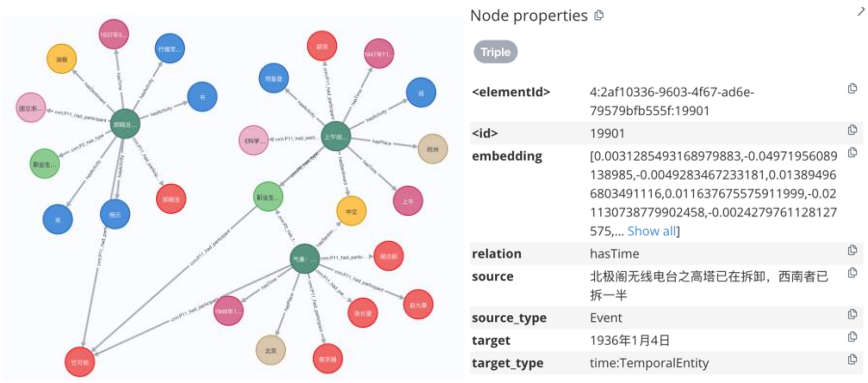

Figure 2. The Knowledge Graph and Its Triples Embedded into Vectors

Thirdly, when a user query is issued, it is embedded into a vector using the same model as the knowledge graph triples. The system then retrieves all candidate entity-relation triples whose similarity scores exceed a predefined threshold. These candidate triples are subsequently presented to the user or expert reviewers, who can inspect, filter, or revise them before final answer generation. **Finally**, to ensure that responses are factually grounded and contextually relevant when answering knowledge-intensive questions, close reading is further utilized in answer evaluation and human interpretation. The RAG is built by using LangChain's modular approach and "gpt-4-turbo". The prompt is designed as follows: This is content from Coching Chu's diary. Answer the following question {Q} based on the retrieved results {R} as accurately as possible. Please synthesize this information to generate a comprehensive and in-depth answer. If the retrieved results are insufficient to answer the question, please generate an answer based on your own knowledge. The web-based user interface of *"Dear Scientist"* is then designed with streamlit, as shown in Figure 3. Given the retrieved information and prompt engineering, the experts craft prompts to correlate retrieved data with the initial query, serving as a decoder to formulate responses to user inquiries, to synthesize and generate answers.

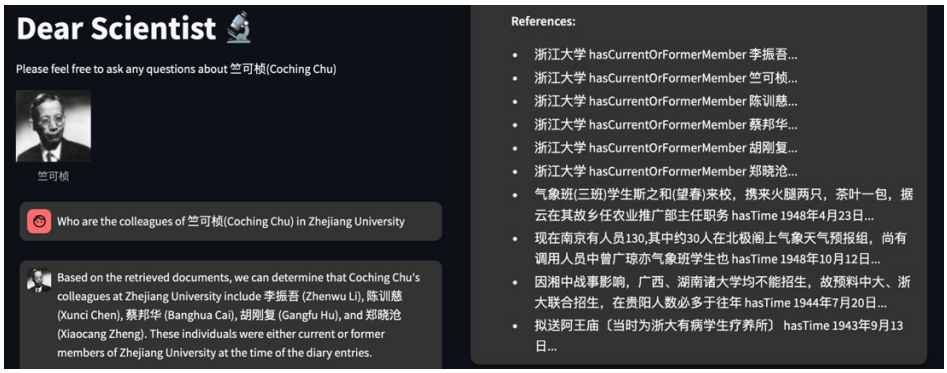

Figure 3. The Web-based User Interface of *"Dear Scientist"*

RESULTS & CONCLUSION

The result shows while traditional RAG systems primarily rely on the surface-level semantics of texts, they often struggle to capture implicit relationships and nuanced references especially in these highly contextual historical documents. After integrating close reading into the RAG pipeline, particularly in the stages of knowledge graph construction and retrieval refinement, the system shows notable improvements in context relevance and answer relevance. This enhancement is especially evident in questions requiring nuanced textual understanding or entity disambiguation. However, when addressing generalized queries, such as "What are Coching Chu's contributions to meteorology?", the system still tends to produce fragmented or skewed answers due to its reliance on locally retrieved contexts, rather than broader conceptual synthesis.

This paper draws inspiration from the notion of "Human-in-the-Loop" widely adopted in AI research and proposes a "Humanities-in-the-Loop" framework (Mosqueira-Rey et al., 2023). This concept emphasizes the human-centered nature of close reading in the humanities, especially in archival research, and aims to position close reading not merely as a corrective to computational methods but as an integral component of the design, evaluation, and application of AI in digital humanities workflows.

GENERATIVE AI USE

We employed GPT4 for the following purpose(s): assisting in generating responses within the RAG system. We evaluated the output by human review. The authors assume all responsibility for the content of this submission.

AUTHOR ATTRIBUTION

First Author: conceptualization, methodology, data curation, formal analysis, writing – original draft; Second Author: supervision, writing – review and editing; Third Author: writing – review and editing.

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Cross-Social Media Platform Emergency Knowledge Collaboration Based on Multimodal Heterogeneous Information Networks

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ABSTRACT
During public crisis events, multimodal contents from social platforms such as text, images, and videos, contain valuable knowledge for official rapid response. However, the fragmentation of such knowledge across platforms undermines timely decision-making and limits the effectiveness of intelligent emergency response. This study proposes a cross-platform emergency knowledge collaboration method based on the multimodal heterogeneous information network. Firstly, the structure of the multimodal heterogeneous information network is defined and constructed for each specific platform, followed by corresponding visualizations. Then, the Enhanced-HGCN model with attention-based fusion is proposed to learn effective representations from the constructed networks. Based on the learned representations, the node–community collaboration strategy is designed to enable semantic and structural alignment across different platforms by linking similar nodes and their corresponding communities. Experimental results indicate that the constructed collaboration network achieves superior structural connectivity and richer semantic representation compared to single-platform networks. This collaboration network provides a stronger foundation for downstream tasks such as emergency knowledge recommendation.

KEYWORDS
Multimodal heterogeneous information network; Cross-social media platform; Emergency knowledge collaboration; Network representation learning; Feature fusion

INTRODUCTION
Emergency knowledge collaboration refers to identifying, integrating, and sharing fragmented multi-sourced information to support timely and effective response (Mercer et al., 2010). It transforms dispersed content into actionable knowledge, enhancing coordination across platforms (McKelvey et al., 2003). Although its value is widely acknowledged, related research remains limited. Existing studies primarily adopt methods such as knowledge graphs or topic models to address semantic alignment, knowledge inference (Yue et al., 2023), and collaboration path construction (Meng et al., 2024; Chen et al., 2023). Some also explore user behavior in cross-platform dissemination. However, in multimodal and heterogeneous settings, current approaches often suffer from weak semantic representation, low fusion accuracy, and poor structural alignment, which limits the effectiveness of knowledge integration under emergency scenarios.

To address these challenges, we propose a cross-platform emergency knowledge collaboration framework based on multimodal heterogeneous information networks (Lin et al., 2024). Our key contributions include: (1) constructing networks that integrate text, images, and videos to represent structural and content heterogeneity; (2) proposing an Enhanced-HGCN model that fuses node-type semantics and multimodal features; and (3) designing a dual-level collaboration strategy that aligns nodes and communities to support cross-platform knowledge integration.

METHODS
In this study, Weibo and Zhihu, two representative social media platforms in China (Zhou et al., 2025), were selected as primary data sources to collect multimodal emergency knowledge data. This study took “flu prevention and control” as a case example and collected emergency knowledge data from two social media platforms. After data cleaning and preprocessing, a total of 62,103 text samples, 47,979 images, and 7,963 videos were obtained. Based on the collected data, platform-specific multimodal heterogeneous information networks were constructed and visualized, which consisted of users, topics, posts, and content nodes, linked via publication and semantic relations. To better capture the structure and meaning of the constructed networks, the Enhanced-HGCN model was proposed and applied, combining edge reconstruction with negative sampling for improved representation (Yang et al., 2024). Finally, a node–community collaboration strategy was adopted to enable cross-platform emergency knowledge integration. Specifically, user and post nodes were aligned based on content and behavioral similarities, and semantically and functionally similar communities were matched across platforms using a community alignment method (Lu et al., 2024). Finally, multiple topological metrics were applied to assess the structural quality and stability of the resulting collaborative network.

RESULTS

This study compared the proposed Enhanced-HGCN model with GCN, HAN, and HGCN on the task of multimodal heterogeneous information network representation. Based on NMI, ARI, and Silhouette Score, Enhanced-HGCN achieves the best overall performance across all three metrics (separately 0.5660, 0.3143, 0.7242). In the collaboration phase, cross-platform alignment generated 76,235 links between post nodes and 41,815 between user nodes. Further, 68 community links were added by matching semantically similar communities detected via the Louvain algorithm. Figure 1 illustrated the constructed cross-platform emergency knowledge collaboration network. The top section shows community structures on Weibo (left) and Zhihu (right), with dashed lines indicating cross-platform alignments. The bottom section presents the collaboration network after node–community alignment, demonstrating enhanced connectivity and semantic cohesion.

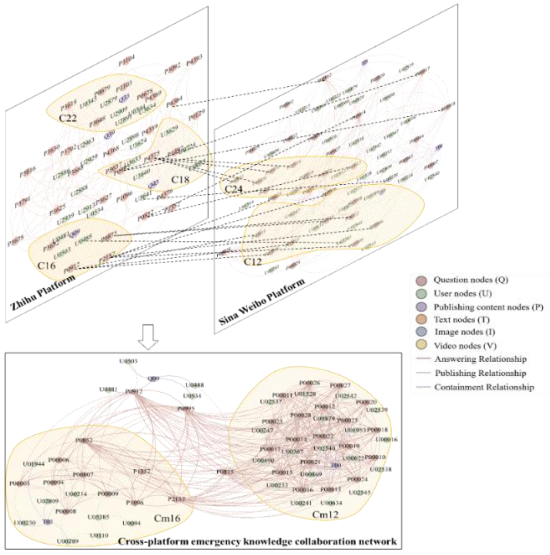

Figure 1. Cross-platform emergency knowledge collaboration network

Finally, the proposed collaboration network was compared with the original Weibo and Zhihu networks using five topological metrics to assess its structural advantages. The results of this comparison were shown in Figure 2.

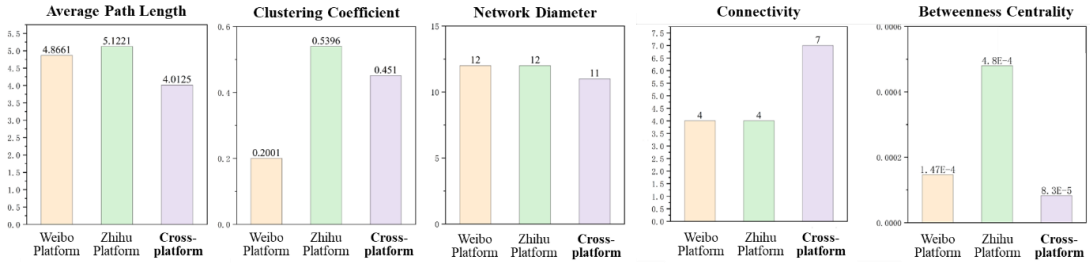

Figure 2. Comparative analysis of emergency knowledge network across different platforms

As shown in Figure 2, the cross-platform network outperformed single-platform networks in key structural metrics. It achieved shorter paths (4.01), a reduced diameter (11), and higher connectivity (7), indicating more efficient and complete structure. The clustering coefficient increased to 0.451, suggesting tighter local structure. Betweenness centrality dropped to 8.3E-5, reducing hub dependency and improving structural balance. This result verified that the collaboration network we constructed enhanced connectivity, compactness, and robustness, providing a strong foundation for effective emergency knowledge organization and recommendation.

DISCUSSION AND CONCLUSION

To address challenges such as semantic inconsistency in multimodal data, structural heterogeneity across social media platforms, and limited granularity in node collaboration, this paper proposes a cross-platform emergency knowledge collaboration method using multimodal heterogeneous information networks. Comparative experiments demonstrate that our approach achieves significant improvements in network representation accuracy and structural connectivity over multiple baselines. Overall, the proposed method exhibits strong cross-platform collaboration capabilities and confirms the feasibility and necessity of integrating multi-source heterogeneous information under complex emergency scenarios. It provides a solid foundation for downstream tasks such as emergency knowledge recommendation.

GENERATIVE AI USE

We confirm that we did not use generative AI tools/services to author this submission.

AUTHOR ATTRIBUTION

Zhou, Wei: methodology, data collection, formal analysis, writing – original draft; An Lu: supervision, writing – review and editing, funding acquisition; Han Ruilian: data curation, visualization, writing – review and editing; Li Gang: project administration, writing – review and editing; Yu, Chuanming: writing – review and editing; data curation.

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Augmenting Engagement with Oral History Archives through LLM-Powered Simulations

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ABSTRACT
Recent advances in generative artificial intelligence offer unprecedented opportunities to reimagine archival sources and deepen public engagement with contested histories. This study investigates how large-language-model (LLM) multi-agent simulations can transform oral-history interviews from *China's Cultural Revolution in Memories: The CR/10 Project* into dynamic dialogues among artificial agents. Using the open-source tool TinyTroupe, we construct personas grounded in authentic testimony and embed them in themed conversation spaces focused on memory, reconciliation, intergenerational understanding, and historical responsibility. The resulting simulations enable audiences to observe how divergent personal narratives collide, converge, and evolve across generations, providing a richer appreciation of this complex past. Preliminary findings indicate that LLM-driven agents can convey multifaceted historical experience in a more immersive and interactive form than traditional interfaces.

KEYWORDS
LLM agents; digital oral history; China's Cultural Revolution

INTRODUCTION
China's Cultural Revolution in Memories: The CR/10 Project is a digital oral-history initiative that preserves memories of the Cultural Revolution (1966–1976), a decade of upheaval that profoundly reshaped Chinese society (Dikötter, 2016). CR/10 features video interviews with people who experienced the Cultural Revolution and those born after, who learned about the historical event through family stories, education, or mass media (ULS, 2017). These testimonies capture diverse—sometimes conflicting—individual voices and perspectives of the Cultural Revolution (Ma, 2022). Yet for audiences unfamiliar with the period, the complexity of these narratives may not be immediately clear: Typically, attaining a nuanced appreciation of the multifaceted accounts of the Cultural Revolution requires engaging with the entire corpus of recorded interviews.

The recent rise of large-language-model (LLM) agents have offered a great opportunity to address this: Research has shown that when placed inside rich and complex environment, LLM agents can acquire and exhibit behaviors that are difficult—or impossible—to script by hand. For example, Park et al. (2023) populated a small "Smallville" town with 25 ChatGPT-backed characters who remember, reflect and plan. From a single seed prompt (one agent wants to host a Valentine's Day party) the society organically spreads invitations, decorates the café, arranges dates and meets on time—demonstrating how LLM loops create believable long-horizon social dynamics. Li et al. (2025) explored the domain-specific potential of LLM agents: In their *Agent Hospital*, every patient, nurse and doctor is an autonomous LLM agent inside a virtual hospital that runs orders of magnitude faster than real time. Doctor-agents treat tens of thousands of synthetic patients, reflect on successes and failures, and update their own case- and rule-bases without any manually labelled data; after this "simulated residency" they outperform state-of-the-art medical agents on the MedQA benchmark. These cases suggest that LLM-driven agent simulations can bring new life into the CR/10 archive, turning static transcripts into believable, multi-voice dialogues. By shifting users from passive readers to active participants who witness memories clash, converge, and evolve in real time, the approach equips audiences to grasp the Cultural Revolution's complexity with a nuance that traditional interfaces cannot provide.

METHODS
We used TinyTroupe (Salem et al., 2024), an LLM-powered simulation tool, to transform CR/10 interviews into interactive dialogues between artificial agents. We developed fictional agent personas—referred to as TinyPerson—based on a curated selection of recorded oral history interviews, incorporating demographic information (such as age, gender, location, and education), historical roles (e.g., victims, Red Guards, post-Cultural Revolution generations), and self-expressed reflections—including personal views, stances, and attitudes toward the Cultural Revolution. Beyond personality traits, key life events, interpersonal relationships, and broader historical contexts are preserved in an "Other Facts" section, capturing the nuanced complexity of individual experiences.

We designed two storytelling rooms and four themed conversation rooms. In the first storytelling room, two Cultural Revolution victims ask each other what they went through during the historical event, how they felt at the time, and how it affected their lives later. In the other storytelling room, two Red Guards share specific events they took part in—what they did, what they believed, how others responded, and how they feel about it now. These storytelling rooms give audiences a foundational repertoire to understand common experiences during the Cultural Revolution.

Four themed conversation rooms are designed to facilitate dialogue among agents. In the *Victims Dialogue Room,* a rural victim (CRWitnessManFromYunnan) and an urban victim (CRWitnessWomanFromBeijing) discuss how geography and social class shaped their experiences and feelings. The *Victims and Perpetrator Dialogue Room* brings these two victims into conversation with a former Red Guard (RedGuardFromBeijing), prompting reflections on personal guilt and reconciliation. The *Intergenerational Understanding Room* brings these two victims into a discussion with three individuals who were children during the Cultural Revolution (CRTeenFromBeijing, CRTeenFromHebei and CRTeenLivedinMilitaryCompound), discussing intergenerational differences in perceptions of the Cultural Revolution. Finally, the *Historical Responsibility Discussion Room* expands the conversation to a former Red Guard (RedGuardFromBeijing) and younger generations who never experienced the Cultural Revolution (WomanAfterCRFromJilin and ManAfterCRFromGuangxi), raising questions about moral responsibility within historical contexts.

PRELIMINARY RESULTS

In the *Victims Storytelling Room*, the victim recalled the terror of watching her father, a respected teacher, being taken away by the Red Guards with no reason. She described feeling betrayed by people she had once trusted, and said the experience shaped her understanding of loyalty and justice. The man victim shared a similar memory of his father being taken away and described the helplessness he felt as a child. Together, they reflected on the atmosphere of fear that surrounded them and the lasting trauma of witnessing public humiliations. In the *Red Guards Storytelling Room*, two former Red Guards recall specific moments from their youth, including shouting revolutionary slogans, targeting teachers, and pressuring classmates during public humiliations. Both express deep regret and reflect on how political zeal blinded them to the pain they inflicted. In the *Victims Dialogue Room*, the rural victim described isolation and a lack of institutional support, exacerbated by ethnic minority status. The urban victim, by contrast, faced intense political scrutiny, like others from "bad" class backgrounds, such as former landlords or intellectuals, who endured harsh persecution. Despite these differences, both expressed the feeling of being misunderstood. *Victims and Perpetrator Dialogue Room* revealed ongoing tensions between victims and a former Red Guard. While the Red Guard struggled between justifying their actions and feeling guilty, the victims questioned whether genuine accountability was possible.

In the *Intergenerational Understanding Room*, the adult victims recalled fear, betrayal, and suffering, emphasizing how these experiences left lasting emotional scars. By contrast, the three individuals who were children during the Cultural Revolution described a more mixed experience. While they acknowledged the confusion and tension that surrounded them, they also recalled the joy of not having to attend school and playing freely with friends. Despite these differences, all participants agreed that the Cultural Revolution left lasting emotional impacts and emphasized the need for younger generations to engage with these personal histories. The *Historical Responsibility Discussion Room* explored whether individual Red Guards should be seen as victims of circumstances. While victims argued for personal responsibility, the former Red Guard argued how political forces had constrained individual choice. In this conversation, younger generations struggled to reconcile these conflicting views.

DISCUSSION AND CONCLUSION

By staging conversations between direct victims, former Red Guards, children who lived through the period, and younger participants who only learned about it afterward, the simulations revealed a range of interesting responses: one of the most interesting is the contrast in memory between generations. Those who lived through the Cultural Revolution as children remembered the Cultural Revolution as a confusing but sometimes joyful time—one shaped not only by fear and instability but also by the relative freedom from academic pressures and the bonds of childhood play. In contrast, those who suffered directly emphasized lasting trauma and unresolved pain. This highlights how age and context shape historical memory. Another interesting phenomenon is that the former Red Guards revealed internal conflict. They shifted between defending their past actions as products of political pressure rather than personal choice and expressing guilt. This tension reflects a broader societal uncertainty about how to access responsibility when individuals participated in violence under intense ideological coercion. These findings suggest that, although each LLM agent do not reproduce verbatim accounts, collectively they can provide a broadly authentic, big-picture representation of the complex narratives surrounding China's Cultural Revolution.

We also encountered several challenges during the simulation process. Repetition was a noticeable issue. The TinyPersons sometimes repeated themselves, diminishing the depth of the conversations. Additionally, the agents relied heavily on vague, generalized expressions—such as "emotional scars" or "shaped who we are"—which obscured nuanced personal detail. Finally, some TinyPersons spoke in overly polite or stiff tones, which made them sound artificial and "inauthentic." For future work, we aim to address the limitations discussed above to refine and expand the simulation repertoire. We will also conduct user focus groups to evaluate the quality and efficacy of the generated simulations, such as their emotional resonance, historical accuracy, educational potential. Finally, we will explore strategies to mitigate potential biases introduced by LLMs in the simulations, aiming to better preserve the authenticity and value of oral history records.

GENERATIVE AI USE

We used ChatGPT for grammatical and stylistic checks.

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