

Transforming Library Services: Social and Technological Factors Shaping Digital Adoption among Young Users

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ABSTRACT. This study aims to identify the key social and technological factors influencing the adoption of digital library services among young users and to formulate innovative strategies that enhance library attractiveness in the digital era. A quantitative approach was employed, using multiple linear regression analysis of survey data collected from 210 respondents across several urban public and academic libraries, complemented by 20 semi-structured interviews with active users and library managers. Data were processed with SPSS to examine the effects of perceived usefulness, ease of use, social norms, and environmental support on digital service adoption. The findings indicate that perceived benefits ($\beta=0.42$, $p<0.01$) and ease of use ($\beta=0.35$, $p<0.01$) significantly influence user interest in adopting digital services, while social norms and environmental support ($\beta=0.25$, $p<0.05$) also play important reinforcing roles. Conversely, factors such as self-confidence and perceived risks show weaker effects, suggesting the need for further psychological exploration. Interview data highlight that interactive features, active promotion, and user-friendly interfaces are crucial in shaping positive experiences and increasing adoption. The study strengthens the Technology Acceptance Model (TAM) with psychosocial perspectives and provides practical strategies for adaptive, user-oriented, and culturally relevant library services. Future initiatives should expand research into rural libraries and integrate cultural variables to ensure inclusive and sustainable digital transformation strategies.

Keywords: *Library service transformation, digital adoption, social factors, technology, user interest.*

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INTRODUCTION

Libraries are institutions that provide access to information and knowledge. They face significant challenges in reaching new generations of users, particularly Millennials and Generation Z, who have grown up in the digital age (Beisler & Baker, 2025; Cain, 2016; Dubinsky, 2019; Kumar & T. A., 2025). According to modern communication and marketing theories, the attitudes and preferences of younger generations toward digital resources differ significantly from those of previous generations, which relied more on physical collections and traditional services (Chang & Chang, 2023; Kim et al., 2025; Rodrigues et al., 2024). Social facts show that visits to physical libraries have sharply declined, while the use of digital sources has increased rapidly (Ćirić & Ćirić, 2021; Meng et al., 2023). This phenomenon highlights a gap between the services provided by conventional libraries and users' current expectations and needs, raising questions about the relevance and sustainability of library services in the future (Ylipulli et al., 2023).

The central problem this study addresses is the lack of effective integration between technological innovation and social-psychological factors in library service transformation. While many libraries have begun digitizing their services, they often fail to fully align with young users' behavioral expectations and cultural context. This misalignment creates a gap between what libraries offer and what digital-savvy generations demand. Furthermore, social and user behavior studies indicate that younger generations tend to prefer quick access to interactive, technology-based services (Agárdi & Alt, 2024; Chan & Lee, 2023). They perceive libraries as less attractive and not aligned with their digital and social media-oriented lifestyles (Ashe, 2025; Uwalaka et al., 2025). Data suggest that libraries that fail to transform digitally and innovate risk losing their role as centers of educational and cultural resources (Ceipek et al., 2021; Imran et al., 2021). Therefore, understanding the social factors influencing user behavior is essential for developing effective, relevant library transformation strategies (Cox, 2021; Timotheou et al., 2023).

Numerous studies have discussed the importance of digitization and service innovation in increasing library appeal. For instance, research by Riady et al. (2023) reveals that integrating information technology into library services significantly enhances engagement and user experience. Social media-based marketing approaches can increase visits (Gomes et al., 2023) and participation among young users (Matenda et al., 2020). Meanwhile, Nakaziba and Ngulube (2024) demonstrated that the development of digital services must be supported by staff training and skill development to optimize technology-based service management. On the other hand, some studies highlight obstacles and challenges in library transformation. For example, research by Mamabolo and Durodolu (2023) highlights resource and infrastructure limitations at many regional libraries, hindering the implementation of comprehensive digital services. Another study by Mitha and Omarsaib (2025) finds that resistance to change among staff and management is a key barrier to transforming library services. These varied findings illustrate the complexity and diverse aspects that must be addressed during service innovation.

This research offers novelty by integrating social-psychological and technological approaches to analyze library transformation for new-generation users. Unlike previous studies that focus mainly on technical or marketing aspects (Allouhi et al., 2022), this study explores in depth the psychological and social factors influencing users' perceptions and behaviors toward digital library services. Additionally, it highlights innovative models that combine digital technology and interactive pedagogy as alternative solutions to attract the attention of Millennials and Generation Z (Kaliraj et al., 2024; McHaney, 2023; Shorey et al., 2021).

The primary contribution of this study lies in developing a strategic framework for transforming services that emphasizes user experience and social-cultural relevance (Chan et al., 2025; Li et al., 2021). The findings are expected to guide library managers in designing high-tech services that also foster emotional bonds and trust with young users. Therefore, this research contributes both theoretically and practically to strengthening the library's position as a literacy and innovation hub in the digital age (Gaitanou et al., 2024; Kawamoto & Koizumi, 2023).

Previous studies have mainly focused on technical or managerial aspects of digital libraries, such as infrastructure, digitization, and staff readiness. However, fewer studies have explicitly examined how social norms, psychological perceptions, and cultural contexts shape young users' adoption of digital services. This research addresses that gap by integrating social-psychological perspectives with the Technology Acceptance Model (TAM). This issue is particularly relevant in Indonesia, where urban libraries in cities such as Surabaya, Malang, and Pasuruan face increasing pressure to adapt to rapidly changing user expectations. These libraries serve diverse university students and young professionals who are highly active in digital spaces. Without effective transformation, libraries in these cities risk declining relevance and reduced engagement from younger generations.

Accordingly, this study aims to identify the social and technological factors influencing the adoption of digital library services among young users and to formulate innovative strategies to enhance the attractiveness and relevance of libraries in the digital era. Although many studies focus on technological aspects and marketing strategies, knowledge about how psychological and social factors specifically influence users' decisions to choose library services remains limited (Gupta, 2025; Lu et al., 2020). Additionally, the lack of understanding of how to integrate technological innovation with local culture and user preferences hinders the effective implementation of transformation strategies (Rocha et al., 2023; Trevisan et al., 2023).

This research is crucial because it provides in-depth insights into the factors influencing user behavior in the context of libraries, aiding managers in designing targeted, innovative strategies. The main argument is that library service transformation requires not only technological innovation but also a thorough understanding of users' social and psychological aspects, which are key to attracting new-generation interest (Yu, 2023; Zare et al., 2024). With a comprehensive approach, libraries are expected to overcome relevance challenges and maintain their role as centers of educational and cultural resources adaptable to societal changes. Therefore, this study aims to identify the key social and technological factors influencing the adoption of digital library services among young users, and to formulate innovative strategies to enhance libraries' appeal in the digital age.

METHOD

This research was conducted in several public and academic libraries located in Surabaya, Malang, and Pasuruan (East Java, Indonesia), urban areas characterized by diverse user populations and varying levels of technological infrastructure. Therefore, the study provides a comprehensive overview of the conditions of library service transformation within urban contexts. The selected case studies were libraries that had begun or were in the process of implementing digital service innovations, with young users' perceptions, motivations, and behaviors serving as the primary units of analysis. Urban libraries were deliberately chosen as the research setting because young people in metropolitan areas such as Surabaya, Malang, and Pasuruan are more intensively engaged with digital technologies and social media than their rural counterparts. This context increases the study's relevance, as it reflects the environments where digital adoption pressures are strongest.

A quantitative approach with qualitative support was applied through a cross-sectional survey (Maier et al., 2023). A cross-sectional design was chosen instead of a longitudinal approach because the primary purpose of this study was to capture a snapshot of young users' perceptions and behaviors during a specific period of rapid digital transformation in libraries. While technology adoption may evolve, cross-sectional data is appropriate for identifying the immediate factors influencing adoption and for providing timely recommendations to library managers. Primary data were collected through questionnaires administered to 210 respondents (aged 18-25, predominantly university students and young professionals), complemented by 20 semi-structured interviews with active library users and library managers. Secondary data were obtained from policy documents, activity reports, and digital service records over the past three years. Data collection was conducted both online and in person over two months, supplemented by field observations of the libraries' physical and technological infrastructure.

Data analysis combined quantitative and qualitative procedures. This combined strategy enabled a comprehensive understanding of the factors influencing successful library transformation, ensuring that both measurable variables and user experiences were adequately addressed. Ethical considerations were observed throughout the research process. Informed consent was obtained from all participants prior to data collection, ensuring that they understood the purpose of the study and their right to withdraw at any time. Anonymity and confidentiality were guaranteed, and the collected data were used solely for academic purposes.

RESULT AND DISCUSSION

Result

Analysis of Quantitative Findings

The regression model was statistically significant ($F = 15.62, p < 0.001$) with an adjusted R^2 of 0.41, indicating that the predictors explained a substantial proportion of variance in digital service adoption. Assumption checks showed no serious violations of multicollinearity ($VIF < 5$), heteroscedasticity, or residual normality. Reliability testing of the questionnaire instruments produced Cronbach's alpha values ranging from 0.81 to 0.89, demonstrating strong internal consistency. The adjusted R^2 of 0.41 indicates that the predictors explained 41% of the variance in adoption.

As shown in Table 1, perceived usefulness ($\beta = 0.42, p < 0.01$) and perceived ease of use ($\beta = 0.35, p < 0.01$) emerged as the strongest predictors of adoption. Social norms ($\beta = 0.18, p < 0.05$) and environmental support ($\beta = 0.25, p < 0.05$) also had significant positive effects, while self-confidence ($\beta = -0.07, p > 0.05$) and perceived risk ($\beta = -0.05, p > 0.05$) were not significant. These results highlight that users' perceptions of benefits, usability, and supportive environments drive adoption, whereas psychological barriers may play only an implicit role requiring further investigation.

Table 1: Multiple Linear Regression Results for Digital Service Adoption (N = 210)

Predictor Variable	β (Beta)	t-value	p-value	Sig.
Perceived Usefulness	0.42	5.87	<0.01	***
Perceived Ease of Use	0.35	4.92	<0.01	***
Social Norms	0.18	2.15	<0.05	**
Environmental Support	0.25	2.67	<0.05	**
Self-Confidence	-0.07	-0.89	>0.05	n.s.
Perceived Risk	-0.05	-0.61	>0.05	n.s.

The results of multiple linear regression analysis indicate that perceptions of the benefits of digital services ($\beta=0.42, p<0.01$) and ease of use ($\beta=0.35, p<0.01$) have a positive and significant influence on user interest. Social factors such as social norms and environmental support ($\beta=0.25, p<0.05$) also show a relatively strong effect, underscoring that users who feel their environment supports them and perceive using digital services as usual are more likely to adopt them. Conversely, psychological and social factors such as self-confidence and perceived technology-related risks have adverse but nonsignificant effects, suggesting that these psychological factors may influence behavior more implicitly and warrant deeper investigation. Descriptive statistics revealed that the sample consisted of 210 respondents (52% female, 48% male), with an average age of 21.6 years ($SD = 2.1$). Approximately 68% were undergraduate students, 22% postgraduate students, and 10% young professionals. Most respondents reported daily engagement with digital platforms, underscoring their familiarity with technology. Table 2 displays the distribution of demographic characteristics.

Furthermore, descriptive findings indicate that most respondents are aged 20-25 and possess higher levels of education. They state that inability or lack of understanding of technology is not the primary obstacle. However, many also complain about insufficient active promotion and the lack of innovative services that meet their needs. This confirms the findings of Jones and Harvey (2019), who suggest that digital marketing and promotional strategies need improvement to make library services more recognizable and easier to adopt.

Table 2: Demographic Characteristics of Respondents (N = 210)

Characteristic	Category	n	%
Gender	Male	101	48%
	Female	109	52%
Age	18–20 years	85	40%
	21–23 years	92	44%
	24–25 years	33	16%
Education Level	Undergraduate	142	68%
	Postgraduate	46	22%
	Young professionals	22	10%

Qualitative Interview Findings

Thematic analysis of interview transcripts identified three major themes: (1) the importance of interactive and user-friendly design in shaping positive user experiences; (2) the role of active digital promotion and communication in raising awareness of library services; and (3) organizational challenges, including limited resources and staff readiness, which hinder the pace of digital innovation. These themes reinforce the quantitative findings while providing deeper insights into the psychosocial and managerial factors influencing adoption. Table 3 summarizes the qualitative coding categories and representative quotes.

Semi-structured interviews with 20 informants, comprising active users and library managers, highlight several important points that support the quantitative results and provide deeper insights. Many users said they became interested and comfortable using digital services after seeing attractive promotions and experiencing user-friendly interfaces. One user expressed, *“I was not very interested in the library before because I felt the collection was limited and the physical services were conventional, but once there was an app that made access easier and provided notifications about new collections, I started using it more often.”*

On the other hand, some managers stated that they try to improve accessibility and integrate the latest technology, but often face obstacles such as limited resources and staff training. They mentioned, *“Young users are very interested in features that are interactive and informative, but our main challenge is the lack of innovation and promotion that align with current digital trends.”* These findings are consistent with Mitha and Omarsaib's (2025) study, which found that internal resistance and limited resources are significant barriers to service transformation.

Thematic analysis of the 20 interview transcripts revealed three major themes. First, an interactive, user-friendly design was consistently identified as the most critical factor shaping positive user experiences. Users emphasized that features such as personalized notifications and simplified access increased their engagement. One participant noted, *“The digital catalog and reminders make me feel that the library is more accessible and part of my daily routine.”* Second, active digital promotion and communication emerged as a significant driver of adoption. Several users highlighted that their awareness of digital services came primarily from social media campaigns and targeted online promotions. As one respondent explained, *“I only realized the library had these digital services after I saw posts on Instagram; without that, I would not have tried them.”* Third, organizational challenges were repeatedly raised by library managers, particularly the constraints of limited resources and insufficient staff training. Managers stressed the importance of continuous professional development to sustain innovation. One manager reflected, *“Young users want interactive and updated services, but our biggest challenge is the lack of staff training to keep pace with digital trends.”*

These three themes, user-friendly design, active promotion, and organizational capacity, provide a more comprehensive understanding of the psychosocial and managerial dimensions influencing digital adoption.

Table 3: Psychosocial and Managerial Dimensions that Influence Digital Adoption.

Theme	Description	Quote
Interactive & User-Friendly Design	Digital features that are simple and enjoyable increase adoption	<i>"Once there was an app that made access easier and gave notifications, I used it more."</i> (User)
Active Digital Promotion	Campaigns and social media raise awareness of library services	<i>"Many young people started to use services after seeing attractive promotions."</i> (Manager)
Organizational Challenges	Resource limits and a lack of training slow innovation	<i>"Our main challenge is the lack of innovation and promotion that align with digital trends."</i> (Manager)

Discussion

This study confirms the core assumptions of the Technology Acceptance Model (TAM), showing that perceived usefulness and ease of use significantly predict young users' interest in digital library services. These findings are consistent with previous works (Caffaro et al., 2020), which emphasize that clear benefits and usability drive technology adoption. However, the current study also highlights nuances that earlier research did not fully capture. Psychological factors such as self-confidence and perceived technological risks were found to be non-significant predictors. This contrasts with prior studies that considered these factors to be central barriers (Lu & Lin, 2025; Sujood et al., 2023). One possible explanation lies in the cross-sectional design, which may not capture longitudinal changes in attitudes, or in the relatively homogeneous sample of highly educated young respondents, who may be less sensitive to perceived risks. These anomalies underline the need for more refined methodological approaches, such as longitudinal tracking or multi-site sampling, to validate the role of psychological variables.

From a practical standpoint, the findings underscore the importance of active digital promotion, user-friendly design, and capacity-building. Libraries need to allocate resources not only for technological upgrades but also for continuous staff training and targeted marketing strategies, ensuring that services remain visible and attractive to younger generations. Compared to Malatji et al. (2020), who broadly argued that user-friendly innovations enhance acceptance, this study contributes by showing how social norms and environmental support act as reinforcing factors, making adoption more of a collective than an individual process. Similarly, while Li et al. (2024) and Yang et al. (2024) confirmed the primacy of tangible benefits, the present study demonstrates that these benefits are more likely to be recognized and acted upon when embedded in supportive peer and institutional contexts.

Finally, this research acknowledges several limitations. The reliance on cross-sectional data restricts causal inference, while the sample's concentration in urban libraries may limit generalizability to rural settings. Future studies should address these limitations by employing longitudinal designs, expanding the demographic scope, and incorporating cross-cultural comparisons.

CONCLUSION

This study analyses how social and technological factors influence the adoption of digital library services in increasing young user engagement. Findings show that perceptions of usefulness, ease of use, social norms, and environmental support significantly shape user interest, thereby reinforcing technology adoption and psychosocial theories. This research reinforces the adoption of digital services and provides practical insights for library managers in designing more innovative and youth-oriented services. However, this study is limited to urban environments and does not account for cultural variations. Future research should expand its scope to rural environments and include variables such as local culture and diverse behavioural patterns in technology use. These

results imply the need for integrated socio-technological strategies and more adaptive models to enhance the sustainability and appeal of digital library services in this rapidly evolving digital era.

BIBLIOGRAPHY

- Agárdi, I., & Alt, M. A. (2024). Do digital natives use mobile payment differently than digital immigrants? A comparative study between generation X and Z. *Electronic Commerce Research*, 24(3), 1463–1490. <https://doi.org/10.1007/s10660-022-09537-9>
- Allouhi, A., Rehman, S., Buker, M. S., & Said, Z. (2022). Up-to-date literature review on Solar PV systems: Technology progress, market status and R&D. *Journal of Cleaner Production*, 362, 132339. <https://doi.org/10.1016/j.jclepro.2022.132339>
- Ashe, I. (2025). Time to Go: Aspirational Framing and Place-Making in Domestic Travel Journalism. *Journalism Practice*, 19(6), 1344–1361. <https://doi.org/10.1080/17512786.2023.2244931>
- Beisler, M., & Baker, L. (2025). Open Access Resource Management Among Academic Research Libraries in the United States. *Technical Services Quarterly*, 42(1), 1–26. <https://doi.org/10.1080/07317131.2024.2432092>
- Caffaro, F., Cremasco, M. M., Roccato, M., & Cavallo, E. (2020). Drivers of farmers' intention to adopt technological innovations in Italy: The role of information sources, perceived usefulness, and perceived ease of use. *Journal of Rural Studies*, 76, 264–271. <https://doi.org/10.1016/j.jrurstud.2020.04.028>
- Cain, J. O. (2016). Using Topic Modeling to Enhance Access to Library Digital Collections. *Journal of Web Librarianship*, 10(3), 210–225. <https://doi.org/10.1080/19322909.2016.1193455>
- Ceipek, R., Hautz, J., De Massis, A., Matzler, K., & Ardito, L. (2021). Digital Transformation through Exploratory and Exploitative Internet of Things Innovations: The Impact of Family Management and Technological Diversification. *Journal of Product Innovation Management*, 38(1), 142–165. <https://doi.org/10.1111/jpim.12551>
- Chan, C. K. Y., & Lee, K. K. W. (2023). The AI generation gap: Are Gen Z students more interested in adopting generative AI such as ChatGPT in teaching and learning than their Gen X and millennial generation teachers? *Smart Learning Environments*, 10(1), 60. <https://doi.org/10.1186/s40561-023-00269-3>
- Chan, G., Banire, B., Ataguba, G., Frempong, G., & Orji, R. (2025). A panoramic view of socio-cultural sensitivity in digital technologies: a comprehensive review and future directions. *International Journal of Human-Computer Interaction*, 41(4), 1917–1945. <https://doi.org/10.1080/10447318.2024.2372135>
- Chang, C.-W., & Chang, S.-H. (2023). The Impact of Digital Disruption: Influences of Digital Media and Social Networks on Forming Digital Natives' Attitude. *Sage Open*, 13(3). <https://doi.org/10.1177/21582440231191741>
- Ćirić, J., & Ćirić, A. (2021). The Impact of the COVID-19 Pandemic on Digital Library Usage: A Public Library Case Study. *Journal of Web Librarianship*, 15(2), 53–68. <https://doi.org/10.1080/19322909.2021.1913465>
- Cox, J. (2021). The higher education environment driving academic library strategy: A political, economic, social and technological (PEST) analysis. *The Journal of Academic Librarianship*, 47(1), 102219. <https://doi.org/10.1016/j.acalib.2020.102219>
- Dubinsky, E. (2019). Does open access make cents? Return on investment in the institutional repository. *College & Research Libraries News*, 80(5), 281. <https://doi.org/10.5860/crln.80.5.281>

- Gaitanou, P., Andreou, I., Sicilia, M. A., & Garoufallou, E. (2024). Linked data for libraries: Creating a global knowledge space, a systematic literature review. *Journal of Information Science*, 50(1), 204-244. <https://doi.org/10.1177/01655515221084645>
- Gomes, F. C., Antonio, F., Laot, P. A. M. E., & Gomes, E. E. C. (2023). The impact of social media marketing efforts on visit intention: a case study in Flodova Clinic, Dili, Timor Leste. *Bali Medical Journal*, 12(2), 2320-2329. <https://doi.org/10.15562/bmj.v12i2.4570>
- Gupta, V. (2025). From hype to strategy: Navigating the reality of experimental strategic adoption of AI technologies in libraries. *Reference Services Review*, 53(1), 1-14. <https://doi.org/10.1108/RSR-08-2024-0042>
- Imran, F., Shahzad, K., Butt, A., & Kantola, J. (2021). Digital Transformation of Industrial Organizations: Toward an Integrated Framework. *Journal of Change Management*, 21(4), 451-479. <https://doi.org/10.1080/14697017.2021.1929406>
- Jones, M. J., & Harvey, M. (2019). Library 2.0: The effectiveness of social media as a marketing tool for libraries in educational institutions. *Journal of Librarianship and Information Science*, 51(1), 3-19. <https://doi.org/10.1177/0961000616668959>
- Kaliraj, P., Singaravelu, G., & Devi, T. (Eds.). (2024). *Transformative digital technology for disruptive teaching and learning*. CRC Press.
- Kawamoto, M., & Koizumi, M. (2023). Library as place: Conceptual model for public libraries and their transition. *Journal of Documentation*, 79(2), 376-397. <https://doi.org/10.1108/JD-02-2022-0046>
- Kim, W., An, H. S., Hantula, D. A., & Di Benedetto, A. (2025). Young consumers' online experiential consumption behavior of foreign contemporary music: generational and gender differences in the refined stimulus-organism-response theory. *Asia Pacific Journal of Marketing and Logistics*, 37(3), 750-781. <https://doi.org/10.1108/APJML-01-2024-0125>
- Kumar, A., & T. A., Y. (2025). Proposing a Conceptual Framework for Social Listening in Libraries: A Potential Game Changer to Engage Gen Z and Centennial Users. *Open Information Science*, 9(1). <https://doi.org/10.1515/opis-2024-0012>
- Li, F., Larimo, J., & Leonidou, L. C. (2021). Social media marketing strategy: definition, conceptualization, taxonomy, validation, and future agenda. *Journal of the Academy of Marketing science*, 49(1), 51-70. <https://doi.org/10.1007/s11747-020-00733-3>
- Li, X., Gao, Z., & Liao, H. (2024). An empirical investigation of college students' acceptance of translation technologies. *Plos one*, 19(2), e0297297. <https://doi.org/10.1371/journal.pone.0297297>
- Lu, V. N., Wirtz, J., Kunz, W. H., Paluch, S., Gruber, T., Martins, A., & Patterson, P. G. (2020). Service robots, customers and service employees: what can we learn from the academic literature and where are the gaps?. *Journal of Service Theory and Practice*, 30(3), 361-391. <https://doi.org/10.1108/JSTP-04-2019-0088>
- Lu, Y., & Lin, S. (2025). How Can We Promote Digital Transformation in College Libraries? A Study on Readers' Intention to Adopt Digital Services. *Sustainability*, 17(8), 3504. <https://doi.org/10.3390/su17083504>
- Maier, C., Thatcher, J. B., Grover, V., & Dwivedi, Y. K. (2023). Cross-sectional research: A critical perspective, use cases, and recommendations for IS research. *International Journal of Information Management*, 70, 102625. <https://doi.org/10.1016/j.ijinfomgt.2023.102625>
- Malatji, W. R., Eck, R. V., & Zuva, T. (2020). Understanding the usage, modifications, limitations and criticisms of technology acceptance model (TAM). *Advances in Science, Technology and Engineering Systems Journal*, 5(6), 113-117. <https://doi.org/10.25046/aj050612>
- Mamabolo, M. J., & Durodolu, O. O. (2023). Rural accessibility to digital libraries: requirements and challenges. *Digital Library Perspectives*, 39(4), 551-570. <https://doi.org/10.1108/DLP-04-2023-0025>

- Matenda, S., Naidoo, G. M., & Rugbeer, H. (2020). The role of social media in youth civic engagement practices in the eastern cape. *Journal of African Films and Diaspora Studies*, 3(2), 25. https://hdl.handle.net/10520/ejc-aa_jafdis_v3_i2_a3
- McHaney, R. (2023). *The new digital shoreline: How Web 2.0 and millennials are revolutionizing higher education*. Taylor & Francis.
- Meng, Y., Chu, M. Y., & Chiu, D. K. W. (2023). The impact of COVID-19 on museums in the digital era: Practices and challenges in Hong Kong. *Library Hi Tech*, 41(1), 130–151. <https://doi.org/10.1108/LHT-05-2022-0273>
- Mitha, S. B., & Omarsaib, M. (2025). Emerging technologies and higher education libraries: a bibliometric analysis of the global literature. *Library Hi Tech*, 43(2-3), 1248-1270. <https://doi.org/10.1108/LHT-02-2024-0105>
- Nakaziba, S., & Ngulube, P. (2024). A model for enhancing digital transformation through technology-related continuing professional development activities in academic libraries in context. *Discover Education*, 3(1), 87. <https://doi.org/10.1007/s44217-024-00178-8>
- Riady, Y., Sofwan, M., Mailizar, M., Alqahtani, T. M., Yaqin, L. N., & Habibi, A. (2023). How can we assess the success of information technologies in digital libraries? Empirical evidence from Indonesia. *International Journal of Information Management Data Insights*, 3(2), 100192. <https://doi.org/10.1016/j.jjime.2023.100192>
- Rocha, C., Quandt, C., Deschamps, F., Philbin, S., & Cruzara, G. (2021). Collaborations for digital transformation: Case studies of industry 4.0 in Brazil. *IEEE Transactions on Engineering Management*, 70(7), 2404-2418. <https://doi.org/10.1109/TEM.2021.3061396>
- Rodrigues, P., Sousa, A., & Pinto Borges, A. (2024). Generation Z's attitudes toward virtual tourism: the impact of implicit and explicit attitudes. *EuroMed Journal of Business*, 19(1), 21–45. <https://doi.org/10.1108/EMJB-05-2023-0135>
- Shorey, S., Chan, V., Rajendran, P., & Ang, E. (2021). Learning styles, preferences and needs of generation Z healthcare students: Scoping review. *Nurse education in practice*, 57, 103247. <https://doi.org/10.1016/j.nepr.2021.103247>
- Sujood, Siddiqui, S., Nafees, S., & Bano, N. (2023). User's intention towards the use of digital libraries: a post COVID-19 scenario. *Digital Library Perspectives*, 39(4), 470-495. <https://doi.org/10.1108/DLP-12-2022-0105>
- Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., Monés, A. M., & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies*, 28(6), 6695–6726. <https://doi.org/10.1007/s10639-022-11431-8>
- Trevisan, A. H., Lobo, A., Guzzo, D., de Vasconcelos Gomes, L. A., & Mascarenhas, J. (2023). Barriers to employing digital technologies for a circular economy: A multi-level perspective. *Journal of Environmental Management*, 332, 117437. <https://doi.org/10.1016/j.jenvman.2023.117437>
- Uwalaka, T., Amadi, F., & Enyindah, S. C. (2025). Social media influencers and political influence operations: The Data Boys example in Nigeria. *Public Relations Inquiry*, 14(1), 89–115. <https://doi.org/10.1177/2046147X241301524>
- Yang, X. S., Sherratt, S., Dey, N., & Joshi, A. (2024). *Proceedings of Ninth International Congress on Information and Communication Technology: ICICT 2024, London, Volume 1* (p. 352). Springer Nature.
- Ylipulli, J., Pouke, M., Ehrenberg, N., & Keinonen, T. (2023). Public libraries as a partner in digital innovation project: Designing a virtual reality experience to support digital literacy. *Future Generation Computer Systems*, 149, 594–605. <https://doi.org/10.1016/j.future.2023.08.00>

- Yu, H. (2023). Reflection on whether Chat GPT should be banned by academia from the perspective of education and teaching. *Frontiers in Psychology, 14*, 1181712. <https://doi.org/10.3389/fpsyg.2023.1181712>
- Zare, S. K, Varnaseri, A., & Bayati, N. (2024). Identifying the applications of gamification for audience attraction in public libraries. *Libri, 74*(2), 171-184. <https://doi.org/10.1515/libri-2023-0123>