Vol. 4 No. 2 (2025)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Enhancing Professional Growth: E-Learning Effects on The Development of Medical Librarians of Khyber Pakhtunkhwa

Muhammad Sohail
M.Phil Scholar, Department of Library and Information Science, University of Peshawar
Sami Ullah
M.Phil Scholar, Department of Library and Information Science, University of Peshawar
Dr. Sajjad Ahmad
Assistant Professor, Department of Library and Information Science, University of Peshawar. Corresponding Author Email: sajjad_lis74@yahoo.com
Dr. Shehzad Ahmad
Associate Professor, Edwards College Peshawar. Email: shehzad_ecp@yahoo.com
Tahir Ullah
BS-LIS Scholar (Final Year), Department of Library and Information Science, University of Peshawar

Author Details

Corresponding E-mail & Author*:
Tabeen Irfan
tabeen.irfan@superior.edu.pk

Keywords: Continuous Professional Development; Medical Librarians; E-Learning.

Received on 14 June 2025
Accepted on 15 July 2025
Published on 17 July 2025

Abstract

This study aimed to analyze the effect of electronic learning on the continuous professional development of medical librarians in Khyber Pakhtunkhwa. The research population included librarians employed in medical and dental institutions across the KP region, comprising 15 public-sector and 17 private-sector institutions. In total, 106 professionals participated, including 32 Librarians, 38 Assistant Librarians, and 36 Library Assistants. A stratified proportionate random sampling technique was utilized to ensure fair representation across all groups. A structured questionnaire, developed based on relevant literature and validated by experts, was designed using a five-point Likert scale. Adopting a quantitative research approach through a survey method, 84 questionnaires were distributed among the sample selected, with 74 returned. After data screening, 71 fully completed responses were analyzed using IBM SPSS version 30, resulting in an 84.5% response rate. The findings highlighted medical librarians' perceptions of electronic learning resources. Respondents strongly agreed with statements such as 'E-learning has encouraged me to explore and recommend additional materials to users' (M = 4.30, SD = 0.991) and 'E-learning enhances my ability to support library services' (M = 4.30, SD = 1.126), indicating positive attitudes toward digital learning tools. Regarding the role of e-learning in continuous professional development, the highest

mean score was recorded for the statement 'I feel confident applying skills learned through e-learning in my workplace' (M = 4.35, SD = 1.084), reflecting strong confidence in the practical benefits of e-learning. However, respondents also expressed concerns about technological challenges, as shown by the high mean score for the statement 'Technical difficulties (e.g., internet connectivity and platform usability) hinder my participation in e-learning' (M = 4.28, SD = 0.929). Based on these insights, the study recommends that institutions prioritize improving internet access and resolving technical barriers to ensure uninterrupted engagement with e-learning platforms. Additionally, libraries should offer training programs to enhance librarians' ability to navigate and effectively utilize digital learning resources.

BACKGROUND OF THE STUDY

Continuous professional development (CPD) is crucial for medical librarians, who must stay current with the rapidly evolving landscape of medical information, technology, and best practices in medical librarianship. Glosiene and Robinson (2007) defined CPD as a process in which library experts broaden their understanding, develop new abilities, uphold professional competence, and stay up-to-date in their field through ongoing job-related training and education. Majid (2004) explained that CPD is an organized approach to learning that fosters the growth and achievement of professional skills, allowing individuals to thrive in an evolving work environment. He also highlighted that the knowledge and information professionals acquire through formal education can become obsolete within a few years. Therefore, continuous learning is essential for keeping professionals updated on new advancements in their field.

CPD for medical librarians has included attending workshops, conferences, seminars, and in-person training sessions (Shahzad & Khan, 2021). However, with the rise of the digital age and the growing incorporation of technology into various aspects of life and work, e-learning has become an essential resource for professional development. E-learning is regarded as an

efficient approach to CPD that improve the librarians' professional skills and help them to learn new and up to date professional knowledge (Shahzad & Khan, 2024; Ismail, Ahmad, 2021). Slebodnik and Riehle (2009) stated that electronic learning offers numerous benefits to information professionals. Shahzad et al. (2023) highlighted that e-learning plays a crucial role in helping librarians adopt emerging technologies in response to evolving workplace demands in libraries.

E-learning involves utilizing electronic media, educational technology, and online resources for education and training. This mode of learning offers several advantages, including flexibility, accessibility, and the ability to provide up-to-date information. It allows medical librarians to engage in CPD activities at their own pace and schedule, making it easier to balance professional development with work and personal responsibilities. Electronic learning for CPD is essential for integrating information technologies in response to evolving job demands for organizational sustainability (Cooke, 2012). A significant positive correlation exists between CPD and improved work performance among librarians (Massis, 2010). Online workshops and webinar offer an affordable and accessible way to engage early library practitioners in continuous professional growth (Coiffe, 2012; Gruber, 2008).

E-learning is optimal for fostering continuous learning and developing essential abilities pertinent to the discipline using creative techniques. Training library employees through e-learning offers a variety of advantages, as traditional training methods may fall short of addressing the demands of the modern era (Sivankalai, 2021). Online learning should be prioritized to develop the necessary skill set among library professionals for providing client-oriented services (Haider et al., 2022). A deficiency in information technology skills creates challenges in acquiring the necessary information (Zhou et al., 2022). Online skills are crucial for actively engaging in continuous

professional development tasks offered via an e-learning platform. Electronic learning for CPD promotes sustainable continuous education that improves organizational effectiveness (Shahzad et al., 2023). Despite the apparent benefits of e-learning for CPD, some numerous challenges and barriers need to be addressed. These encompass challenges such as access to technology, digital literacy, the quality of e-learning materials, and learner motivation and engagement. Furthermore, there is limited research specifically focusing on the impact of e-learning on the CPD of medical librarians, making it difficult to develop targeted strategies for effective e-learning implementation.

Medical librarians play a critical role in this ecosystem by providing healthcare professionals with access to reliable information, assisting with research, and managing vast amounts of data. Therefore, staying current with the latest developments in medical librarianship is essential. E-learning provides an efficient and effective means for medical librarians to acquire new skills, update their knowledge, and remain competent in their roles. In short, understanding the role of e-learning in the continuous professional development of medical librarians is essential in ensuring their ability to maintain high-quality information services, and support to healthcare professionals in an ever-evolving information landscape. This study will enhance the existing body of knowledge on CPD for medical librarians, providing a basis for future studies and practical implementations in medical librarianship.

RESEARCH QUESTIONS

This study covers the following research questions:

1. What is the attitude of medical librarians toward electronic learning resources?
2. What is the effect of e-learning on the continuous professional development of medical librarians?

LITERATURE REVIEW

OVERVIEW OF ELECTRONIC LEARNING

E-learning, usually referred to as e-learning, encompasses various forms of digital education, including networked collaborative learning, computer-based learning, online learning, web-supported learning, and computer-assisted learning (Bhabal, 2008). The primary goal of e-learning is to enhance the quality of teaching and learning by leveraging modern technology. In particular, online learning has revolutionized education and professional training, prompting the need for more efficient and effective alternatives, such as in the field of medical librarianship (Lee et al., 2014).

One of the defining features of e-learning environments is their ability to integrate various communication technologies on independent platforms, facilitating seamless interaction and knowledge sharing (Onal et.al., 2017). The rapid growth of online learning has been fueled by widespread internet access, and its impact on higher education is evident. For instance, during the fall of 2011, approximately 32% of higher education students in the United States about 6.7 million individuals were enrolled in at least one online course (Allen & Seaman, 2013). This shift signifies a lasting transformation in teaching practices, emphasizing the role of Learning Management Systems (LMSs) in supporting both educators and students (Hershkovitz & Nachmias, 2011). Furthermore, e-learning serves as a crucial tool for lifelong learning, equipping individuals with essential skills through innovative instructional methods. For library professionals, e-learning provides substantial benefits, as traditional training approaches may no longer suffice in meeting modern demands (Sivankalai, 2021). To enhance customer-centered services, it is imperative to prioritize e-learning in the training and development of library professionals (Haider et al., 2022). As the digital era continues to evolve, e-learning remains

a dynamic and indispensable component of education and professional development.

STUDIES OF ELECTRONIC LEARNING

Shahzad et al. (2023) analyzed systematic review of 30 studies from 16 countries to analyze the role of e-learning in the continuing professional development of university librarians. The mostly studies were conducted in the United States (n = 8, 26.7%), followed by Nigeria (n = 3, 10%), Canada (n = 2, 6.7%), Italy (n = 2, 6.7%), and Pakistan (n = 2, 6.7%), while the remaining countries contributed one study each (n = 1, 3.3%). The study identified key factors influencing e-learning adoption, including organizational survival (73.3%, n = 22), adaptation to continuous changes (66.7%, n = 20), adoption of emerging technologies (60%, n = 18), and professional growth opportunities (56.7%, n = 17). Additionally, accessibility, affordability, and lifelong learning opportunities were emphasized in 50% (n = 15) of the studies. These factors demonstrated that e-learning plays a crucial role in equipping library professionals with the necessary skills to navigate technological advancements and evolving job requirements. Its benefits, e-learning adoption faces several challenges. Technical difficulties such as broadband issues, power outages, and network failures were reported in 40% (n = 12) of the studies, while financial constraints, including insufficient government and institutional funding, were highlighted in 36.7% (n = 11). Resistance to change and reliance on conventional learning models posed barriers in 30% (n = 9) of the studies, whereas overwhelming workloads and job-related stress hindered participation in 26.7% (n = 8). To mitigate these challenges, the study recommended best practices, including budget allocation for CPD initiatives (43.3%, n = 13), the establishment of e-learning units (40%, n = 12), provision of professional learning opportunities (50%, n = 15), and enhanced technical support (46.7%, n = 14).

Thomas and Bryson (2021) explored the concept of "real-time blended" learning, where online and proximate students are taught simultaneously. A key concern was the potential formation of two distinct cliques, with online learners becoming passive observers rather than active participants. Using action-based research, the study aimed to develop an inclusive approach by modifying classroom layouts, utilizing specialized equipment, facilitating diverse social interactions, and enhancing communication methods. Effective teaching in this setting requires continuous adjustments to instructional design and delivery, adopting an ambidextrous approach that balances immediate student engagement with ongoing instructional refinement. The study emphasized real-time and iterative modifications based on student feedback to optimize learning experiences. The evaluation of student performance suggested that this approach helped to create a more equitable learning environment, ensuring that both online and proximate students received a comparable educational experience.

Semertzidou (2020) discussed the crucial role of medical librarians in the development and implementation of Electronic Medical Records (EMRs) in modern hospitals. Hospitals manage vast amounts of information related to patients, treatments, medications, and medical equipment, necessitating efficient information systems. EMRs serve as a centralized, flexible record integrating patient treatment, examinations, and laboratory results. Medical librarians play a vital role in collaborating with doctors to establish EMRs, ensuring the proper integration of medical databases and online resources. Additionally, they must stay informed about advancements in primary health care and advocate for continuous access to digital medical information within the EMR system. Their strategic involvement enhances the accessibility and effectiveness of patient records, ultimately contributing to improved healthcare services.

Yavuzalp and Bahcivan (2019) studied the online learning self-efficacy scale: its adaptation into Turkish and interpretation according to various variables. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (.981) and Bartlett's test of Sphericity (χ^2 = 59,781.714, $p < .05$) confirmed the suitability of the data for factor analysis. Unlike the original three-factor model, the Turkish version exhibited a single-factor structure after the removal of one item. Factor loadings ranged from .845 to .921, explaining 79.91% of the total variance. Reliability findings showed a high consistency (Cronbach's α = .987). Descriptive statistics indicated that participants generally perceived themselves as self-efficacious in online learning. Kruskal-Wallis H tests revealed no significant differences in self-efficacy scores based on gender (χ^2 = .390, $p > .05$) or school type (χ^2 = 1.120, $p > .05$).

Kuonga (2015) examined students' perceptions of their online learning experiences, motivation, and sense of community through surveys, interviews, and online course interactions. The study found that all participants believed the online course met their expectations, providing convenience, flexibility, and increased reflection time. Most participants were satisfied, not all preferred online courses over traditional face-to-face learning. Regarding motivation, students' confidence increased throughout the semester as they gained knowledge and received feedback. Participants generally managed their study time effectively, although some initially struggled with time management but improved by adjusting their schedules. Help-seeking behavior indicated that students preferred working independently but sought assistance in face-to-face settings rather than online interactions. The study also explored students' perceptions of their membership in an online learning community. Although participants felt comfortable sharing thoughts and recognized a supportive environment, they lacked strong emotional bonds due to limited human interaction. Overall, while online learning provided

valuable opportunities, the absence of personal engagement remained a challenge.

OVERVIEW OF CONTINUOUS PROFESSIONAL DEVELOPMENT

Continuous Professional Development is an essential process that enables specialists to enhance their knowledge, skills, and competencies to stay relevant in their respective fields. According to Robinson and Glosiene (2007), CPD is "a process by which library and information practitioners update their knowledge, acquire new skills, maintain professional competence, and improve their abilities by regular in-service training and education." In the context of medical and dental institutions in Khyber Pakhtunkhwa, CPD plays a critical role in ensuring that medical librarians remain proficient in managing and disseminating health information effectively. As libraries serve as knowledge hubs in medical education and research, librarians must continuously update their expertise to provide high-quality services to healthcare professionals, researchers, and students.

Majid (2004) emphasizes that formal education provides only foundational knowledge, whereas professionals must continually adapt to new developments in their fields. For medical librarians, this means keeping pace with emerging trends in digital libraries, electronic databases, evidence-based medicine resources, and information literacy training. CPD activities such as workshops, online courses, professional conferences, and hands-on training sessions help medical librarians refine their skills in information retrieval, bibliographic management, and research support. The implementation of CPD in medical and dental institutions in Khyber Pakhtunkhwa is particularly vital due to the increasing reliance on digital health records, artificial intelligence-driven medical research, and open-access publishing.

Furthermore, CPD fosters collaboration among medical librarians, enabling them to share best practices and innovative strategies to improve library

services. By engaging in CPD, librarians can enhance their ability to guide medical professionals in accessing reliable and up-to-date health information, ultimately contributing to better patient care and medical research outcomes. Despite the benefits of CPD, challenges such as limited funding, lack of institutional support, and time constraints often hinder participation in professional development activities. Addressing these barriers through policy initiatives, institutional incentives, and collaboration with national and international library associations can help strengthen CPD programs for medical librarians in Khyber Pakhtunkhwa.

STUDIES OF CONTINUOUS PROFESSIONAL DEVELOPMENT

Campbell-Meier and Goulding (2019) explored the impact of Continuing Professional Development (CPD) workshops on library professionals, finding that most participants applied newly acquired skills to their professional practice, service development, and organizational restructuring. Many integrated techniques into meetings, resource development, or storytelling, while others influenced service redesign, such as shifting early literacy programs or establishing new roles like a "Service Design Adviser." Some also shared their knowledge with colleagues, enhancing professional growth within their organizations. However, challenges included time constraints, with shorter workshops feeling rushed, and organizational barriers, such as slow adoption of new ideas or waiting for managerial changes. Despite these obstacles, participants generally found the workshops valuable, though they emphasized the need for extended training sessions and greater institutional support.

Ahmad, Ahmad, and Hussain (2019) presented a comprehensive analysis of CPD among librarians working in public and private universities of Peshawar, Pakistan. The study, based on quantitative methodology, surveyed 110 librarians using a structured questionnaire and analyzed responses from

88 participants (an 80% response rate). Findings revealed that although CPD is recognized as essential, it is rarely practiced due to lack of institutional support, awareness, and formal systems. Librarians showed high interest in enhancing both hard skills (like library automation and research methods) and soft skills (such as communication and leadership). Preferred CPD modes included workshops, seminars, and mentorship programs, while motivators included skill enhancement and personal growth. Key de-motivators identified were time constraints, lack of administrative support, and financial barriers.

Edet and Alex-Nmecha (2021) examined the digital professional development of librarians in Rivers State, Nigeria, focusing on the digital skills acquired, tools used, applications of these skills, and challenges faced. The findings revealed that most librarians had acquired skills in online search techniques (83.9%), digital learning (58.1%), social media marketing (45.2%), and digital marketing (32.3%). In comparison, fewer had expertise in metadata (12.9%), big data (19.4%), and cybersecurity (6.5%). In terms of digital tools, Zoom (90.3%), webinars (74.2%), and YouTube (58.1%) were the most widely used for professional development, whereas platforms like Future Learn (3.2%) and Whova (6.5%) were less utilized. The study also found that librarians primarily applied their digital skills in online research (80.6%), current awareness services (54.8%), and selective dissemination of information (54.8%), with other applications in cataloging, classification, and reference services. Challenges in acquiring digital skills were significant, with lack of funds (93.5%) being the most critical barrier, followed by inadequate institutional support (58.1%) and insufficient information on available digital tools (51.6%). Other issues included a lack of interest (35.5%) and limited training opportunities (3.2%).

Saleem and Ashiq (2020) examined the CPD of library and information science professionals in Pakistan, identifying key challenges and areas for

improvement. The study found that LIS professionals require both professional and personal competencies, but outdated curricula and inadequate training opportunities hinder skill development. Technological advancements necessitate ongoing CPD, yet financial constraints, lack of institutional support, and limited access to training programs remain significant barriers. The importance of CPD in enhancing librarians' digital literacy, management skills, and automation expertise is much appreciated. However, existing LIS training programs and professional associations fail to meet the evolving demands of the profession. While professional associations, such as the Pakistan Library Association (PLA), have played a role in CPD, their impact has been inconsistent due to internal challenges and political influences.

Khan and Du (2017) investigated the role of social media in the professional development of female librarians in Pakistan. Analysis revealed a significant relationship between age and social media use for professional development ($p < 0.05$), with older respondents (36-40 years) showing higher engagement. Cross-tabulation indicated that librarians whose parents had higher education levels were more likely to use social media for professional growth. Furthermore, 59% of participants reported that social media improved their professional skills, and 63% agreed it enhanced their understanding of professional issues. Marital status influenced engagement, with unmarried women facing more family restrictions on social media use compared to married women. Qualitative Facebook chat analysis identified themes such as identity construction, assertiveness, and self-disclosure, with experienced librarians reporting a positive impact of social media on professional growth. However, assertiveness on social media was not universally perceived as beneficial for career development. The study concluded that social media is a crucial tool for Pakistani female librarians' professional development, despite social and cultural barriers.

Shahzad and Khan (2021) investigated the impact of Continuing Professional Learning Programs (CPLPs) on university librarians through a quantitative study of 84 respondents. Descriptive statistics indicated that CPLPs significantly enhanced user-centered services (M = 4.27, SD = .657), updated knowledge (M = 4.15, SD = .634), and improved virtual reference services (M = 4.10, SD = .800), though the perceived impact on libraries' societal image was lower (M = 3.76, SD = .676). Inferential analysis showed no significant qualification-based ($F(3, 63) = 1.288$, $p = .286$) or designation-based ($F(3, 63) = .192$, $p = .901$) differences, suggesting CPLPs benefit all professionals regardless of background. Experts recommended market-based courses (n = 7), financial support for training (n = 8), and structured policies for professional development (n = 9–10). The study highlights CPLPs as crucial for skill enhancement, leadership development, and improved library services.

Ashiq and Saleem (2020) studied LIS professionals in Pakistan face significant challenges in continuing professional development due to outdated curricula, limited training opportunities, and financial constraints. There is a strong need for ICT skills, digital literacy, and automation training, but employer support and institutional collaboration remain weak. Professional associations play a role in CPD, but their efforts are inconsistent and politically influenced. Additionally, LIS professionals in remote areas face even fewer opportunities for skills enhancement. The findings emphasize the need for a coordinated national approach involving LIS schools, professional associations, and government bodies to improve CPD initiatives.

Robinson (2019) conducted a study on CPD among special librarians in Jamaica, with a 62% response rate from distributed questionnaires. The study found high motivation for CPD, with primary drivers being staying updated with changes in librarianship (69%) and personal satisfaction (65%). Formal CPD activities, such as attending seminars (73%) and professional meetings

(58%), were common, while informal activities included reading professional literature (81%) and networking (81%). Challenges included lack of funding (65%) and time constraints (46%), though employer support was moderate (54%). Participants expressed strong interest in CPD topics related to technology, such as digital library management (89%) and database management (73%). Most kept abreast of CPD opportunities through professional associations (69%) and personal research (65%), reflecting a proactive approach to professional development.

Mehmood and Younus (2023) examined continuing professional development for LIS practitioner's in the University Libraries of Punjab. The majority had less than five years of experience. Familiarity with specific professional skills was assessed, showing a generally high level of competence across various areas. A comparison of foundational professional knowledge between public and private university professionals, based on 11 key statements, revealed no statistically significant differences ($p > 0.05$).

Ullah (2014) conducted a study analysis of training initiatives undertaken for professional development of library professionals in Pakistan. The study identified a steady increase in training initiatives over the years, with the highest percentage (24%) occurring in 2013, while 2009 had the lowest (13%). The majority of training sessions were short-term, with 57% lasting only one day and 24% lasting two days, largely due to financial and institutional constraints. The study also found that face-to-face training was the most common mode (92%), with a small percentage incorporating online elements. Geographically, Punjab (45%) and Islamabad (28%) hosted the highest number of training sessions, while no training was conducted in Baluchistan. Regarding the fields of training, workshops focused on research skills and Endnote, library automation, and library management. Open-source software

such as DSpace, Koha, and Greenstone were common training topics, whereas proprietary software and cloud computing received little attention.

Kaijun et al. (2018) investigated a study on the effect of continuing education with digital technology on professional growth and job satisfaction of librarians. The study found significant relationships between continuing education and professional growth, with job skills (t=1.816), professional knowledge (t=1.944), and self-development (t=1.789) having notable effects on administrative competence, professional competence, and professional ethics. Similarly, professional growth had a significant positive impact on job satisfaction (t-values ranging from 2.134 to 2.327). Additionally, continuing education was directly correlated with job satisfaction (job skills: t=2.289, professional knowledge: t=2.166, self-development: t=2.414).

Tyrell (2015) examined the gender distribution, employment levels, and attitudes toward Continuing Professional Development among librarians at The University of the West Indies and the University of Technology. Findings indicate a significant gender disparity, with female librarians outnumbering male librarians by approximately 3:1 at both institutions. The duration of employment did not show a strong correlation with hierarchical position, suggesting that tenure alone does not guarantee advancement. The study also assessed CPD engagement. Over 60% of UWI respondents and 90% of UTECH respondents had attended formal training in the past five years. Additionally, nearly all respondents expressed interest in CPD, with 97% at UWI and 100% at UTECH confirming their willingness to pursue professional development. Respondents unanimously agreed on the importance of CPD for career advancement, though opinions varied on its level of significance. The absence of a professional development policy was not considered a major deterrent to CPD participation, with 75% of UWI respondents and 80% of UTECH respondents stating it did not influence their pursuit of CPD.

Chan and Auster (2003) examined factors influencing the professional development of reference librarians, focusing on participation in formal and informal updating activities. The study found that respondents spent an average of 31.5 hours annually in formal activities and 300.8 hours in informal activities. Motivation, managerial support, and job status significantly influenced participation in formal activities, while barriers to participation had a negative effect. Similarly, managerial support and motivation positively affected participation in informal activities, whereas job status, subjective age, barriers, and updating climate negatively influenced participation. The most significant barrier to participation was lack of time, followed by lack of relevance.

RESEARCH DESIGN

Quantitative research approach was used to address the research questions. Consequently, data were collected from various medical librarians in Khyber Pakhtunkhwa using a survey method.

The study's population comprised of all the medical librarians in Khyber Pakhtunkhwa. According to the PMDC official website, Khyber Pakhtunkhwa has 32 medical and dental institutions. The public sector institutions are 15 and the private sector is 17. The total population of this study was 106, which included 32 librarians, 38 Assistant Librarians, and 36 Library Assistants. The sample size was 84 (calculated through Rao-soft) librarians. This study utilized stratified proportionate random sampling; the strata 1, 2, and 3 are librarian, assistant librarian, and library assistant, respectively. The formula used is nx = Nx * n / N, where nx is the sample size of the stratum, Nx is the size of the entire population, n is the desired overall sample and N is the population size.

S1-Librarians= 32*84/106= 25

S1-Assistant Librarians= 38*84/106= 30

S1-Library Assistants= 36*84/106= 29

DATA COLLECTION

A questionnaire was developed with the help of relevant literature and was reviewed and pilot-tested for content validity and reliability. The researcher used a final drafted questionnaire to collect the data. First the researchers developed the list of respondents in each stratum (List of Librarians; List of Assistant Librarians, and a List of Library Assistant). Then 25 Librarians, 30 Assistant Librarians and 29 Library Assistant were selected from these lists through Lottery method. The questionnaires were distributed by hand and through email/WhatsApp among the randomly selected medical librarians.

Pilot Test and Result of Reliability Analysis

For Pilot test the librarians of Nursing and Allied Health Sciences Institutions in Peshawar district were selected, and 25 questionnaires were distributed non-randomly among the librarians of these institutions. The pilot test and reliability analysis results are presented in Table 1. The overall reliability of the scale, which consists of 30 items, was measured using Cronbach's alpha and yielded a value of 0.791, indicating acceptable internal consistency. The subscale measuring Attitude toward Electronic Learning Resources (18 items) had a Cronbach's alpha of 0.693, suggesting moderate reliability. The subscale assessing the effect of E-Learning on Continuous Professional Development (CPD) (12 items) demonstrated strong reliability with a Cronbach's alpha of 0.800. These results indicate that the overall scale and its subscales exhibit acceptable to good reliability, making them suitable for further data collection and analysis.

TABLE 1: *RELIABILITY STATISTIC*

S. No	Scale	No of Items	CA Value
1	Overall Scale	30	.791
2	Attitude toward Electronic Learning Resources	18	.693

3	Effect of E-Learning on the CPD	12	.800

RESULTS

RESPONSE RATE

The completed questionnaires were reviewed for accuracy and completeness before data processing. A total of 84 questionnaires were distributed to respondents, with 74 being returned. Each question was carefully examined to ensure accuracy and completeness. Only three questionnaires were found to be incomplete and were excluded from the study. Data from the 71 fully completed questionnaires were analyzed using IBM SPSS version 22, resulting in a response rate of 84.5%.

GENDER-WISE ANALYSIS OF THE RESPONDENT

The gender-wise distribution of the respondents is presented in Table 2 out of a total of 71 participants, 43 were male, accounting for 60.6% of the sample. In contrast, 28 respondents were female representing 39.4% of the total sample. These figures indicate a higher proportion of male participants compared to female participants in this study.

TABLE 2: *GENDER-WISE FREQUENCY DISTRIBUTION OF THE RESPONDENTS (N=71)*

Gender	Frequency	Percentage
Male	43	60.6
Female	28	39.4
Total	**71**	**100.0**

AGE-WISE ANALYSIS OF THE RESPONDENT

The age-wise frequency distribution of the respondents is in Table 3. Among the 71 participants, the majority (n = 40, 56.3%) belonged to the 25-35 age group. This was followed by respondents aged 46 and above, comprising 18 individuals (25.4%). The 36-45 age groups had the lowest representation, with 13 respondents (18.3%). These findings indicate that the sample was

predominantly composed of younger individuals, with fewer middle-aged and older respondents.

TABLE 3: *AGE-WISE DISTRIBUTION OF THE RESPONDENTS (N=71)*

Age	Frequency	Percentage
25-35	40	56.3
36-45	13	18.3
46 & Above	18	25.4
Total	**71**	**100**

DESIGNATION-WISE ANALYSIS OF THE RESPONDENT

The designation–wise frequency distribution of the respondents is presented in Table 4 among the 71 participants, the largest group consisted of assistant librarians (n =27, 38.0%), followed by library assistants (n=25, 35.2%). Librarians made up the smallest proportion, with 19 respondents (26.8%). These results indicate that the majority of the sample comprised assistant librarians and library assistants, with librarians representing the least frequent designation among the respondents.

TABLE 4: *DESIGNATION-WISE FREQUENCY DISTRIBUTION OF THE RESPONDENTS (N=71)*

Designation	Frequency	Percentage
Librarian	19	26.8
Assistant Librarian	27	38.0
Library Assistant	25	35.2
Total	**71**	**100.0**

MAJOR FINDINGS OF THE STUDY

ATTITUDE TOWARD ELECTRONIC LEARNING RESOURCES

The first objective of the study was to examine the attitude of medical librarians toward the use of electronic learning resources. For this purpose, the respondents were asked a question, including 18 statements to assess their

attitude toward electronic learning resources. The data and details of the findings are given below:

The descriptive statistics for the 'overall attitude' of medical librarians toward electronic learning resources are presented in Table 5. The mean score for 'overall attitude' was 3.85 (SD = 0.822), indicating a generally positive perception of e-learning resources among respondents. The descriptive statistics on the attitude statements of medical librarians towards electronic learning resources are also presented in Table 5. The highest mean scores were observed for the statements; 'I want to use e-learning systems to enhance library services and training programs' (M=4.30, SD = 1.126) and 'they encouraged me to explore and recommend additional material and resources to users' (M =4.30, SD = 0.991), indicating strong agreement among respondents regarding the benefits of e-learning systems in supporting library services. Similarly, the statements 'E-learning systems help me effectively manage my time and workload' (M=4.20, SD=1.023) and 'using e-learning systems improves my efficiency in managing and delivering information' (M=4.14, SD=1.125) received relatively high mean scores, suggesting that librarians perceive e-learning as a valuable tool for enhancing efficiency.

The statements with moderate agreement included; 'The content provided through the e-learning system is informative and relevant for medical education' (M=4.411, SD=1.063) and 'They help reduce the overall cost of accessing and providing educational material' (M=4.07, SD=1.060). However, lower mean scores were recorded for 'E-learning systems complement traditional library services and in-person support' (M=3.45, SD=1.216) and 'E-learning systems help me efficiently support learning activities for students and faculty' (M=3.38, SD=1.553), indicating a relatively weaker agreement with these aspects. The lowest mean score was observed for 'I prefer to recommend e-books and other electronic resources over

physical formats' (M=3.18, SD=1.407), suggesting a more neutral stance on the preference for digital over physical resources. These findings highlight that while medical librarians generally hold positive attitudes toward e-learning resources, their perceptions vary depending on the specific aspects of e-learning systems.

TABLE 5: *DESCRIPTIVE STATISTICS REGARDING RESPONDENTS' ATTITUDE TOWARD ELECTRONIC LEARNING RESOURCES (N=71)*

S. No	Statements	Mean	Std. Dev.
1	I want to use e-learning systems to enhance library services and training programs.	4.30	1.126
2	They encourage me to explore and recommend additional materials and resources to users.	4.30	.991
3	E-learning systems help me effectively manage my time and workload.	4.20	1.023
4	Using e-learning systems improves my efficiency in managing and delivering information.	4.14	1.125
5	The content provided through e-learning systems is informative and relevant for medical education.	4.11	1.063
6	They help reduce the overall cost of accessing and providing educational materials.	4.07	1.060
7	I enjoy using and promoting e-learning platforms as part of my professional work.	4.03	1.331
8	They enhance my ability to provide reliable and high-quality educational resources.	4.00	1.265
9	E-learning is an efficient method for delivering teaching and research support.	3.87	1.170
10	I actively recommend e-learning systems to students, faculty, and researchers.	3.82	1.268

11	E-learning platforms are easy to navigate and handle, even for complex tasks.	3.79	1.341
12	E-learning systems enable flexible collaboration with instructors, researchers, and students.	3.72	1.365
13	E-learning systems are valuable tools for facilitating distance education in medical fields.	3.69	1.527
14	These systems provide all the necessary resources and materials I need to support users.	3.68	1.510
15	They make it easier for me to organize and manage library services and resources.	3.65	1.196
16	E-learning systems complement traditional library services and in-person support.	3.45	1.216
17	E-learning systems help me efficiently support learning activities for students and faculty.	3.38	1.553
18	I prefer to recommend e-books and other electronic resources over physical formats.	3.18	1.407
	Overall Attitude toward E-Learning Resources	1.72	3.85

EFFECT OF E-LEARNING ON CONTINUOUS PROFESSIONAL DEVELOPMENT OF MEDICAL LIBRARIANS

The descriptive statistics for the overall effect of e-learning on the continuous professional development (CPD) of medical librarians are presented in Table 6. The mean score for the overall effect of e-learning on CPD was 4.05 (SD = 0.661), indicating a generally positive perception among respondents regarding the effect of e-learning in their professional growth. The descriptive statistics on the effect of e-learning on the continuous professional development of medical librarians are presented in Table 6. The highest mean score was observed for the statement 'I feel confident applying skills learned through e-learning in my workplace' (M = 4.35, SD = 1.084), indicating strong

agreement among respondents regarding the practical applicability of e-learning. Similarly, the statement 'Technical challenges (e.g., internet connectivity, and platform usability) hinder my participation in e-learning' received a high mean score (M = 4.28, SD = 0.929), highlighting concerns about technological barriers. The flexibility of e-learning was also acknowledged as beneficial, with 'The flexibility of e-learning allows me to balance work and professional development effectively' scoring a mean of 4.27 (SD = 1.095). Other statements receiving relatively high mean scores included 'Online courses provide sufficient depth and quality to support my professional growth' (M = 4.25, SD = 1.010) and 'E-learning helps me stay updated with advancements in medical librarianship' (M = 4.18, SD = 1.199), suggesting that respondents view e-learning as a valuable tool for professional growth. Additionally, 'E-learning tools encourage collaboration and networking with peers in medical librarianship' (M = 4.15, SD = 1.154) and 'E-learning has positively impacted my ability to provide better services by gaining new knowledge' (M = 4.14, SD = 1.004) further support the positive impact of e-learning on skill development and service quality.

Moderate agreement was found with statements such as 'The lack of personal interest in e-learning affects the quality of my learning and engagement' (M = 4.00, SD = 1.219) and 'E-learning has increased my motivation to pursue continuous professional development' (M = 3.94, SD = 1.170). Lower mean scores were observed for 'The availability of specialized e-learning programs tailored to medical librarianship is sufficient' (M = 3.92, SD = 1.118) and 'I find e-learning more cost-effective than traditional in-person professional development methods' (M = 3.90, SD = 1.161). The lowest mean score was recorded for 'E-learning platforms have made it easier for me to access professional development opportunities' (M = 3.25, SD = 1.619), suggesting some challenges in accessibility. These findings indicate that while

medical librarians generally perceive e-learning as beneficial for professional development, challenges such as technological barriers, accessibility, and engagement remain key concerns.

TABLE 6: *DESCRIPTIVE STATISTICS OF RESPONDENTS' EFFECT OF E-LEARNING ON CONTINUOUS PROFESSIONAL DEVELOPMENT (N=71)*

S.No	Statements	Mean	Std. Dev.
1	I feel confident applying skills learned through e-learning in my workplace.	4.35	1.084
2	Technical challenges (e.g., internet connectivity and platform usability) hinder my participation in e-learning.	4.28	.929
3	The flexibility of e-learning allows me to balance work and professional development effectively.	4.27	1.095
4	Online courses provide sufficient depth and quality to support my professional growth.	4.25	1.010
5	E-learning helps me stay updated with advancements in medical librarianship.	4.18	1.199
6	E-learning tools encourage collaboration and networking with peers in medical librarianship.	4.15	1.154
7	E-learning has positively impacted my ability to provide better services by gaining new knowledge.	4.14	1.004
8	The lack of personal interest in e-learning affects the quality of my learning and engagement.	4.00	1.219
9	E-learning has increased my motivation to pursue continuous professional development.	3.94	1.170
10	The availability of specialized e-learning programs tailored to medical librarianship is sufficient.	3.92	1.118
11	I find e-learning more cost-effective than	3.90	1.161

	traditional in-person professional development methods.		
12	E-learning platforms have made it easier for me to access professional development opportunities.	3.25	1.619
	Overall Effect of E-learning on CPD	4.05	0.660

GENDER-BASED DIFFERENCES IN THE ATTITUDE TOWARD E-LEARNING RESOURCES

An independent samples t-test was conducted to examine gender differences in attitudes toward e-learning resources. Levene's test for equality of variances yielded a statistically significant result, F (1, 69) = 7.329, p = .009, indicating that the assumption of equal variances was violated. As a result, the t-test results under the "Equal variances not assumed" row were interpreted. The analysis revealed a significant difference in attitudes toward e-learning resources between male and female respondents, t (66.54) = -2.990, p = .004. The mean difference between the groups was -.50697, with a standard error of .16958. The 95% confidence interval ranged from -.84550 to -.16844, suggesting that the true mean difference in the population falls within this range. Since the p-value (p = .004) is less than .05, the findings indicate a statistically significant difference in attitudes toward e-learning resources between male and female respondents. This suggests that gender plays a role in shaping perceptions of e-learning resources, with one group (likely females) showing a lower attitude score compared to the other.

GENDER-BASED DIFFERENCES REGARDING THE EFFECT OF E-LEARNING ON CONTINUOUS PROFESSIONAL DEVELOPMENT

Independent samples t-test was run to assess gender differences in perceptions of e-learning's impact on continuous professional development. Levene's test for equality of variances was not statistically significant, F (1,69) = 2.484, p = .120, indicating that the assumption of equal variances was met.

Therefore, the t-test results were interpreted under the "Equal variances assumed" row. The analysis showed no statistically significant difference between male and female respondents in their perceptions of e-learning's role in continuous professional development, t (69) = -1.069, p = .289. The mean difference between the groups was -.17130, with a standard error of .16028. The 95% confidence interval ranged from -.49105 to .14845, suggesting that the true mean difference in the population likely falls within this range. Since the p-value (p = .289) is greater than .05, the results indicate that gender does not significantly influence perceptions of e-learning's impact on continuous professional development.

DISCUSSION

The study's first objective was to examine the attitude of medical librarians towards electronic resources. Eighteen statements were presented to the respondents, among which the highest means score were observed for: 'I want to use e-learning systems to enhance library services and training programs. (M = 4.30, SD = 1.126) and 'they encouraged me to explore and recommended additional material and resources to users' (M = 4.30, SD = 0.99). However lower mean scores for the electronic learning system complement traditional library services and in-person (M = 3.45, SD = 1.216), electronic learning system help me efficiently support learning activities for student and facility (M = 3.38, SD = 1.553), and I prefer to recommended e-book and other electronic resources over physical formats (M = 3.18, SD = 1.407). The results are similar to the findings of (Gosine-boodoo & Mcnish 2009) mentioned the Learning new skills 83.9%, Technological changes 75.0%, and Personal development 67.9%.

The second objective is to analyze the effect of electronic learning on the continuous professional development of medical librarians. The highest mean score was observed for the statement "I feel confident applying skills

learned through e-learning in my workplace" (M = 4.35, SD = 1.084), indicating strong agreement among respondents regarding the practical applicability of e-learning. Similarly, the statement "Technical challenges (e.g., internet connectivity, and platform usability) hinder my participation in e-learning" received a high mean score (M = 4.28, SD = 0.929), highlighting concerns about technological barriers. The flexibility of e-learning was also acknowledged as beneficial, with "The flexibility of e-learning allows me to balance work and professional development effectively" scoring a mean of 4.27 (SD = 1.095). The result mentioned Shahzad and Khan (2021). The user-centered services in libraries (M=4.27, SD=0.657), Updated knowledge of library professionals (M=4.15, SD=0.634), Better virtual reference services (M=4.15, SD=0.634), and quick delivery of information resources to end-users (M=4.09, SD=0.712).

Moreover, the results of the study proved that an independent samples t-test was conducted to compare attitudes toward e-learning resources between genders. Levene's test for equality of variances was significant, F (1,69) = 7.329, p = .009, indicating that the assumption of equal variances was violated. Therefore, the t-test results not assuming equal variances were interpreted. The results showed a significant difference in attitudes toward e-learning resources between genders, t (66.54) = -2.990, p = .004. The mean difference was -0.507 (SE = 0.170), with a 95% confidence interval ranging from -0.846 to -0.168, suggesting a statistically significant disparity in attitudes.

The independent samples t-test was conducted to compare the effect of e-learning on continuous professional development between genders. Levene's test for equality of variances was not significant, F (1,69) = 2.484, p = .120, indicating that the assumption of equal variances was met. Therefore, the t-test results assuming equal variances were interpreted. The results

showed no statistically significant difference between genders in the effect of e-learning on continuous professional development, t (69) = -1.069, p = .289. The mean difference was -0.171 (SE = 0.160), with a 95% confidence interval ranging from -0.491 to 0.148.

CONCLUSIONS

The study aimed to explore the impact of electronic learning on the continuous professional development of medical librarians in Khyber Pakhtunkhwa, alongside their attitudes toward e-learning resources. The findings suggest that medical librarians generally hold a positive attitude toward e-learning, recognizing its role in enhancing library services, improving efficiency, and expanding access to educational materials. The respondents acknowledged that e-learning platforms enable effective time management, cost reduction, and flexibility in balancing work and professional development. However, despite the overall positive perception, certain aspects, such as the complementarity of e-learning with traditional library services and the preference for digital over physical resources, received relatively lower agreement levels, suggesting a need for further integration and adaptation.

E-learning was found to have a significant impact on continuous professional development, with medical librarians reporting increased confidence in applying e-learning-acquired skills in the workplace. Respondents agreed that e-learning helped them stay updated with advancements in medical librarianship, provided networking opportunities, and contributed to their professional growth. However, challenges such as technical difficulties (e.g., internet connectivity and platform usability), limited availability of specialized e-learning programs, and accessibility concerns were highlighted as barriers to its full effectiveness.

While the study found no significant difference in attitudes toward e-learning based on designation, a gender-based analysis revealed a statistically

significant difference, with male and female respondents differing in their perceptions of e-learning. However, when assessing the impact of e-learning on continuous professional development, no significant gender- or designation-based differences were observed. This suggests that while individual perceptions may vary, the overall impact of e-learning on professional development remains consistent across different librarian roles.

RECOMMENDATIONS

Based on the findings, several recommendations were put forwarded to enhance the effect of electronic learning on the continuous professional development of medical librarians in Khyber Pakhtunkhwa.

- Institutions should invest in improving internet connectivity and resolving technical barriers to ensure seamless access to e-learning platforms.
- Libraries should provide training on platform usability to ensure librarians can navigate and utilize e-learning tools effectively.
- Medical librarians should be encouraged to blend digital and physical resources to create a more holistic approach to learning and information dissemination.
- E-learning platforms should include modules that support in-person library functions, ensuring a balanced integration of digital and traditional services.
- Universities and library associations should collaborate to design tailored e-learning programs focused on medical librarianship.
- More online courses, workshops, and certifications specific to library science and medical information management should be developed to enhance professional development opportunities.
- Libraries should promote e-learning participation through incentives such as certification programs, career advancement opportunities, and recognition for completing courses.

- Awareness campaigns should be conducted to highlight the benefits of e-learning, particularly for those who remain hesitant or lack motivation to engage with digital learning resources.
- Librarians should be encouraged to participate in online discussion forums, virtual conferences, and collaborative learning platforms to enhance professional interactions.
- Institutions should facilitate partnerships with national and international organizations to broaden access to diverse learning materials and expertise.

REFERENCES

Ahmad, S., Ahmad, S. & Hussain, I. (2019). Continuing Professional Development (CPD) of University Librarians: A Case Study. *Pakistan Library and Information Science Journal,* 50(1), 15-28.

Allen, I. E., & Seaman, J. (2013). Changing course. *Ten Years of Tracking Online Education in the United States. Babson Survey Research Group and Quahog Research Group, LLC*.

Bhabal, J. (2008). E-learning in LIS education: Case study of SHPT School of Library Science. *International CALIBER,* 631-638.

Campbell-Meier, J., & Goulding, A. (2019, July). The impact of CPD workshops on library professional practice. In *Proceedings of the Annual Conference of CAIS/Actes du congrès annuel de l'ACSI*.

Chan, D. C., & Auster, E. (2003). Factors contributing to the professional development of reference librarians. *Library & Information Science Research*, *25*(3), 265-286.

Coiffe, D. J. (2012). Webinars: Continuing education and professional development for librarians. *Journal of the Leadership & Management Section*, 9(1).

Cooke, N. A. (2012). Professional development 2.0 for librarians: Developing an online personal learning network (PLN). *Library Hi Tech News*, 29(3), 1-9.

Glory, E. D. E. T., & ALEX-NMECHA, J. C. (2023). Professional Development for Librarians in Rivers State in A Digital Age. *Niger Biblios: Journal of National Library of Nigeria*, *33*(2), 47-55.

Gruber, A. M. (2008). Wired professional development: new librarians connect through the web. *College & Undergraduate Libraries*, 14(4), 95-102.

Haider, U., Batool, S. H., Malik, A., Mahmood, K., & Safdar, M. (2022). Bonding between information literacy and personal information management practices: A survey of electronic media journalists. *Information and Learning Sciences*, 123(5/6), 298-316.

Hershkovitz, A., & Nachmias, R. (2011). Online persistence in higher education web-supported courses. *The Internet and Higher Education*, *14*(2), 98-106.

Ismail, M. & Ahmad, S. (2021). Knowledge, Awareness and Practice of Continuing Education Program (CEP) among Librarians in Pakistan. *Pakistan Library and Information Science Journal*, 52(1), 29-40.

Khan, A., & Du, J. T. (2017). Professional development through social media applications: a study of female librarians in Pakistan. *Information and Learning Science*, *118*(7/8), 342-353.

Kuong, H. C. (2015). Enhancing online learning experience: From learners' perspective. *Procedia-Social and Behavioral Sciences*, *191*, 1002-1005.

Lee, Y. H., Hsiao, C., & Purnomo, S. H. (2014). An empirical examination of individual and system characteristics on enhancing e-learning acceptance. *Australasian Journal of Educational Technology,* 30(5).

Majid, S. (2004). Continuing professional development (CPD) activities organized by library and information study programs in Southeast Asia. *Journal of Education for Library and Information Science*, 58-70.

Massis, B. E. (2010). Continuing professional education: ensuring librarian engagement. *New Library World*, 111(5/6), 247-249.

Mehmood, S. T., & Younus, M. (2023). Continuing Professional Development for Lis Professionals in University Libraries of Punjab. *Pakistan Journal of Humanities and Social Sciences*, *11*(4), 4511-4521.

Önal, N., Ibili, E., & Çaliskan, E. (2017). Does Teaching Geometry with Augmented Reality Affect the Technology Acceptance of Elementary School Mathematics Teacher Candidates? *Journal of Education and Practice 8*(19), 151-163.

Robinson, L., & Glosiene, A. (2007). Continuing professional development for library and information science: A case study of a network of training centers. In *Aslib Proceedings,* (Vol. 59, No. 4/5, pp. 462-474). Emerald Group Publishing Limited.

Robinson, M. G. (2019). Continuing professional development and special librarians in Jamaica. *Library Management*, *40*(6/7), 416-427.

Saleem, Q. U. A., & Ashiq, M. (2020). The facts of continuing professional development for LIS professionals in Pakistan: a literature review. *The Bottom Line*, *33*(3), 263-271.

Saleem, Q. U. A., & Ashiq, M. (2020). The facts of continuing professional development for LIS professionals in Pakistan: a literature review. *The Bottom Line*, *33*(3), 263-271.

Semertzidou, E. (2020). The Role of Medical Librarians in Creating an Electronic Medical Record of a Patient in a Modern Hospital. *Journal of Library and Information Sciences*, *8*(2), 11-15.

Shahzad, K., & Khan, S. A. (2021). Impact of continuing professional learning programs (CPLPs) on university librarians. *Library Philosophy and Practice*.

Shahzad, K., & Khan, S. A. (2021). Impact of continuing professional learning programs (CPLPs) on university librarians. *Library Philosophy and Practice*.

Shahzad, K., & Khan, S. A. (2024). Role of e-learning for the continuing professional development of university librarians of Pakistan to deliver value-added services: an explanatory study. *Global Knowledge, Memory, and Communication*, 48(1), 1-19.

Shahzad, K., Khan, S. A., Javed, Y., & Iqbal, A. (2023). E-learning for continuing professional development of university librarians: A systematic review. *Sustainability*, 15(1), 849.

Shahzad, K., Khan, S. A., Javed, Y., & Iqbal, A. (2023). E-learning for continuing professional development of university librarians: A systematic review. *Sustainability*, *15*(1), 849.

Sivankalai, S. (2021). Academic libraries support e-learning and lifelong learning: A case study. *Library Philosophy and Practice (e-journal)*, 8(18), 1-18.

Slebodnik, M., & Riehle, C. F. (2009). Creating online tutorials at your libraries: Software choices and practical implications. *Reference & User Services Quarterly*, 49(1), 33-51.

Thomas, M., & Bryson, JR. (2021). Combining proximate with online learning in real-time: ambidextrous teaching and pathways towards inclusion during COVID-19 restrictions and beyond. *Journal of Geography in Higher Education, 45*(3), 446-464.

Ullah, A. (2014). Analysis of training initiatives undertaken for professional development of library professionals in Pakistan. *Available at SSRN 2918803*.

Yavuzalp, N., & Bahcivan, E. (2020). The online learning self-efficacy scale: Its adaptation into Turkish and interpretation according to various variables. *Turkish Online Journal of Distance Education*, *21*(1), 31-44.

Yu, K., Gong, R., Jiang, C., Hu, S., Sun, L., & Luo, Y. Z. (2018). A study on the effect of continuing education with digital technology on professional

growth and job satisfaction of librarians. *EURASIA Journal of Mathematics, Science and Technology Education*, *14*(7), 3285-3292.

Zhou, W., Dai, L., Zhang, Y., & Wen, C. (2022). Personal information management on social media from the perspective of platform support: a text analysis based on the Chinese social media platform policy. *Online information review*, 46(1), 1-21.