

Examining the Attitudes Towards Artificial Intelligence Literacy and Its Effect on the Job Performance of University Librarians in Khyber Pakhtunkhwa, Pakistan

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ABSTRACT

This study examined the attitudes of university librarians in Khyber Pakhtunkhwa (KP) toward artificial intelligence (AI) literacy and its impact on job performance. A quantitative research design was employed, using a structured questionnaire and stratified proportionate random sampling to collect data from 86 librarians across different designations. The findings revealed a generally positive attitude toward AI literacy ($M = 3.71$, $SD = .418$) and high levels of job performance ($M = 4.39$, $SD = .799$). Inferential analyses (t-test and ANOVA) indicated no statistically significant differences in AI literacy attitudes or job performance based on gender, institution, or designation. The study concludes that librarians in KP demonstrate strong readiness for AI adoption. It recommends the development of structured AI literacy training programs to further enhance librarians' professional performance.

Keywords: Attitudes Toward AI, Artificial Intelligence Literacy, Job Performance, University Librarians.

INTRODUCTION

Background of the Study

In 1965, artificial intelligence was described as the discipline focused on designing and building intelligent machines (McCarthy, 2007). AI involves the science of engineering and creating intellectual technologies capable of solving various problems using different techniques like language processing, neural systems, machine learning, Deep learning, and generative AI. In learning and education, AI supports practitioners by forecasting their progress and performance, suggesting suitable learning materials, and automating evaluations. This enhances the overall learning and education experiences of the professionals through the use of intelligent systems, chatbots and recommendation systems.

Nowadays, Chat GPT, created by OpenAI, has emerged as an impressive AI-powered tool. Essentially, it is a Chatbot driven by AI subfields, such as natural language processing and huge language models (Celik, 2023). For example, AI operates behind the scenes when individuals search for information online (Such as Google) or receive video recommendations on social media platforms like YouTube.

Artificial Intelligence: Conceptual Analysis

Artificial intelligence has been defined by various scholars such as Owolabi et al. (2022), who stated that artificial intelligence is “A collection of technologies and computational methods designed to enable computers to adaptively make logical and informed decisions when faced with uncertain or changing environmental conditions”. Artificial intelligence, as a rapidly developing technology, has started to gain an important place in education systems. Teachers need to have artificial intelligence literacy in order to adapt to this technology and use it effectively in the classroom environment. This is critical to ensure that teachers both understand the technology and transfer it to their students accurately and effectively (Goksu & Goksu, 2024). AI in education can enhance student achievement by providing customized learning experiences and increasing the effectiveness of instructional strategies (Holmes et al., 2019). However, the realization of this potential depends on teachers' mastery of artificial intelligence technologies.

Job Performance

JP refers to the efficiency with which job officials perform the actions included in their job description. It represents behaviors and outcomes that are relevant to organizational goals (Campbell, 1990). In simpler terms, job performance is how well an individual performs the duties and responsibilities of their given role. Job performance encompasses the overall impact of an employee's actions, whether beneficial or detrimental, on the attainment of organizational objectives (Rotundo & Sackett, 2002). Previous research has identified several personal factors that influence librarians' Job performance, including age, Job positions, qualifications, work experiences, attitude towards their work, self-interest, passion for learning, and the standard of available equipment and tools. Campbell's (1990) framework of job performance emphasizes that performance is a multi-faceted construct, encompassing various forms such as task-related activities, contextual behaviors, and counterproductive actions. He highlighted the importance of knowledge, skills, and motivation as key factors influencing performance. Additionally, the motivation-performance relationship, as outlined in Vroom's (1964) Expectancy Theory, underscores that an individual's level of motivation, driven by their expectations and the significance they place on potential outcomes, plays a crucial role in shaping their performance.

Statement of the Problem

The rapid progress of artificial intelligence (AI) has revolutionized numerous sectors, including academic libraries, where AI tools are now widely applied in data management, enhancing library services, and optimizing resources. However, the attitude of university librarians toward AI literacy and their capacity to comprehend and effectively implement AI in library operations is not yet been explored. In the context of university libraries in Khyber Pakhtunkhwa, the extent to which librarians embrace or resist AI literacy may significantly impact their job performance. Librarians who are well-versed in AI may enhance their efficiency, streamline processes, and provide better services to students and faculty. Conversely, individuals with negative attitudes towards AI or who lack the necessary skills may struggle with integrating new technologies, potentially leading to lower performance, increased stress, and job dissatisfaction.

Despite AI's growing importance in academic settings, limited research explores the attitudes of university librarians in Khyber Pakhtunkhwa towards AI literacy and how these attitudes affect their job

performance. This research examines the association between university librarian's attitude towards AI literacy and their performance outcomes. Understanding these dynamics is crucial for designing targeted professional development programs and fostering an environment that supports technological advancement and improved job performance in academic libraries.

Research Questions

1. What is the university librarian's attitude towards AI literacy?
2. What is the job performance level of university librarians?
3. What is the association between the librarian's attitude towards AI literacy and their job performance level?

LITERATURE REVIEW

Alam et al. (2025) examined the level of AI literacy and the perceptions held by MLIS students in India. Utilizing a quantitative approach, the researchers surveyed 118 final-year MLIS students, gathering responses through WhatsApp groups and personal networks. The study explored students' levels of AI literacy, along with their perceptions and attitudes toward AI technologies. The findings offer valuable insights into strategies for enhancing AI literacy to meet the evolving demands of library services and user expectations. Notably, natural language processing emerged as the most influential AI technology, while other areas such as recommender systems and data mining also attracted considerable interest. The study highlights the critical importance of integrating AI literacy training within LIS programs to ensure graduates remain competitive in the rapidly changing information landscape.

Ullah et al. (2026) examined the factors influencing the adoption of ChatGPT among Library and Information Science (LIS) faculty members in Pakistan using the Technology Acceptance Model (TAM). Employing a quantitative survey design, the study assessed the effects of perceived ease of use, usefulness, social influence, innovativeness, facilitating conditions, and trustworthiness on ChatGPT adoption. The findings revealed that perceived usefulness, social influence, innovativeness, facilitating conditions, and trustworthiness significantly and positively influenced faculty members' adoption of ChatGPT, whereas perceived ease of use had no significant effect. The study concluded that institutional support, trust in AI technology, and the perceived benefits of ChatGPT are key determinants of its acceptance and use in higher education.

E Rana et al. (2025) investigated the impact of internet use on the academic performance of undergraduate students at the University of Peshawar. Using a quantitative survey design, the study found that students primarily used the internet for completing assignments and research projects, communicating with teachers and classmates for academic purposes, and engaging in social interactions. The results revealed a strong and statistically significant positive relationship between internet use and students' academic performance, as measured by CGPA. The study concluded that effective internet use enhances academic achievement by providing rapid access to information and facilitating academic communication among students.

Riaz et al. (2025) examined the technology adoption behavior of women faculty members during information-seeking activities at the University of Peshawar. Using a quantitative survey approach, the study found that female faculty generally demonstrated positive attitudes toward technology, showing confidence in using technological tools and willingness to learn new applications. Social influence was identified as a significant factor affecting technology adoption, as participants frequently relied on

colleagues for guidance and support. However, barriers such as limited access to technology, outdated equipment, and insufficient training negatively affected technology use. The study concluded that improving technological infrastructure and providing structured training programs are essential for enhancing technology adoption and effective information-seeking practices among women faculty members.

Taskiran (2023) explored the effects of an artificial intelligence course on nursing students' preparedness for utilizing medical AI technologies. Given the anticipated transformative impact of AI through wholly areas of nursing, ranging from management and medical care to education, policy, and research, the education aimed to assess how targeted training influences readiness. This quasi-experimental research included 300 third-year nursing students, divided into an experimental group of 171 students who completed 28 hours of AI instruction and a control group of 129 students who received no such training. Data were gathered through a socio-demographic form and the Medical Artificial Intelligence Readiness Scale and analyzed using IBM SPSS software. The analysis highlights the significant role of AI education in preparing nursing students for the demands of a technology-driven healthcare environment. Participation in the AI course was found to enhance students' readiness to engage with medical AI tools. The study further emphasizes the need for curriculum reforms in nursing education to ensure alignment with ongoing advancements in healthcare technology.

Aslam et al. (2025) investigated the current status of AI founded innovation in smart library services and examines how university librarians can foster innovation through their expertise and adaptive strategies. This study utilized a mixed- method approach. The qualitative approach involved in depth conversations conducted with 10 chief librarians from university libraries, while the quantitative study included a sample of 150 university library professionals from across Pakistan. Data was gathered from multiple sources, including Whatsapp and Facebook librarian group, emails, and direct interactions with librarians. These results are further supported by research from another author, emphasizing that workshops and seminars are valuable tools for preparing librarians with the knowledge and skills needed to serve their communities efficiently. These findings provide insights into how the way librarians acquire digital literacy skills.

Saklaki (2024) examined the influence of students' literacy skills, particularly media and digital literacy, as a significant factor in shaping their overall attitudes towards AI. This study explores university students' overall attitude towards artificial intelligence (ATAI) and how these relate to their perspectives on AI ethics, as well as their media and digital literacy. These results are consistent with earlier studies (13, 16), which indicate that university students have a moderately positive attitude towards AI, showing a willingness to embrace it and acknowledge its potential profits. These findings highlight the importance of focused technology and educational initiatives that address both the potential of AI and its ethical complications. This study also stresses the importance of considering students' attitudes towards AI ethics when designing AI educational programs.

Ogbogbaidi et al. (2025) explored the motivations behind librarians' use of AI technologies in Edo and Delta states, Nigeria. Librarians can adopt a range of AI technologies to enhance their service function. A descriptive survey design was used. A validated questionnaire was used to gather data from the participants. The gathered data was examined through both descriptive and inferential statistical methods. This study recommended increasing awareness of AI among librarians.

Sindermann et al. (2021) developed a concise instrument the Attitudes toward Artificial Intelligence (ATAI) scale available in German, Chinese, and English. Members included individuals from Germany (N = 461; 345 females), China (N = 413; 145 females), and the United Kingdom (N = 84; 65 females), all of whom completed the ATAI scale. The study examined and compared the factorial structure of the scale

across these cultural groups. The finalized ATAI scale consisted of five items, and the study aimed to introduce a brief, reliable, and valid tool for assessing attitudes toward AI. The results indicate the utility of this measure across diverse linguistic contexts and suggest that future research should consider various AI domains and applications when analyzing gender-related differences in AI perceptions.

Abayomia et al. (2021) investigated the level of awareness and perceptions related to the use of artificial intelligence in managing university libraries across Nigeria. Using a mixed-methods research process, the study collected data from 100 academic librarians, randomly selected from ten universities. Additionally, structured interviews were conducted with the heads of ICT or automation departments at these ten purposively chosen institutions. The results revealed that a majority of academic librarians were knowledgeable about AI applications in library environments. However, a significant barrier to AI adoption was the fear of job displacement. The study's findings aligned with previous research conducted in the United States and Canada, which also indicated a strong degree of familiarity among academic librarians concerning the possible benefits of AI to improve library services.

Owolabi et al. (2022) examined the knowledge and preparedness of polytechnic students to adopt artificial intelligence technologies. The study recommended that polytechnic library management consider alternative energy sources and incorporate hands-on information and communication technology training into the academic curriculum. Polytechnics were purposively selected for the research, and participants included students enrolled in either the first or second year of the Higher National Diploma program who were registered with their institution's library. A structured questionnaire was used to assess students' behavioral intentions toward adopting artificial intelligence technologies. The results indicated that scholars remained generally conscious of the use of artificial intelligence in library processes, primarily through library orientation sessions. The study employed the Unified Theory of Acceptance and Use of Technology framework to assess the factors influencing scholars' willingness to engage with artificial intelligence technologies in Nigerian polytechnic institutions.

Lameras and Arnab (2021) showed a comprehensive assessment to examine and synthesize the processes, practices, tools, and applications of artificial intelligence in education. The study followed the PRISMA framework to structure the review process, which included systematic searching, screening, coding, and analysis of 141 sources. The findings offer valuable insights into how artificial intelligence can support educators in designing, visualizing, and managing AI-enhanced teaching and learning environments. They highlight the potential of AI systems to generate meaningful, data-informed pedagogical representations through computational modeling of learners and educational domains. The results are organized around key themes that emerged during the analysis.

Various Studies on Job Performance

Job performance pertains to the specific duties and obligations carried out in a workplace setting. It also encompasses how effectively and efficiently employees convert inputs into final outputs (Guo et al., 2020). High levels of job performance are influenced by numerous factors, including leadership skills, professional knowledge, and individual competencies. As noted by McCann et al. (2020), individuals with clearly defined goals tend to perform better than those without. Key determinants of strong job performance include personal attributes, leadership capabilities, and specialized expertise.

Khan et al. (2026) investigated workplace information literacy (WIL) among paramedical staff working in Medical Teaching Institute hospitals in Peshawar, including Lady Reading Hospital, Khyber Teaching Hospital, and Hayatabad Medical Complex, and examined its effect on job performance. Using a quantitative descriptive survey design, data were collected from 170 valid respondents through standardized WIL and job performance scales. The findings revealed a moderate level of workplace

information literacy and a relatively high level of job performance among participants. No significant gender differences were found in either WIL or job performance, while years of experience significantly influenced workplace information literacy. Most importantly, the study identified a strong positive relationship between workplace information literacy and job performance, indicating that employees with higher information literacy skills tend to perform better in their jobs.

Rahman et al. (2025) investigated the influence of emotional intelligence (EI) on the job performance of librarians working in public libraries of Khyber Pakhtunkhwa. Using a quantitative survey approach, the study found that librarians exhibited relatively high levels of emotional intelligence, particularly in perceiving, using, and understanding emotions. The results revealed a strong and statistically significant positive relationship between emotional intelligence and job performance. The study concluded that enhancing librarians' emotional intelligence can contribute to improved workplace effectiveness and professional performance.

Lyu and Luo (2024) investigated the influence of digital transformation on job performance, particularly focusing on the relationship between digital literacy and job effectiveness among university educators. Their study aimed to fill an existing gap in the literature. A total of 586 teachers from three Chinese universities participated in the research, which utilized a quantitative method through a cross-sectional survey framework. The analysis incorporated confirmatory factor analysis, correlation analysis, descriptive statistics, structural equation modeling, and bootstrap testing. The findings revealed that digital literacy positively influences job performance, with emotional authorization and job agreement acting as mediating variables. This underscores the crucial role of digital competencies in refining job performance and offers fresh insights into the psychological mechanisms underlying this relationship.

Campbell (1990) Job performance has been widely studied due to its pivotal role in determining both individual career success and organizational effectiveness. It is generally understood as behavior that is under the control of the individual and contributes to organizational goals. Contemporary definitions go beyond mere task execution and include adaptive and innovative behaviors. Griffin, Neal, and Parker (2007) introduced a three-dimensional model of work performance encompassing task performance, contextual performance, and adaptive performance. Adaptive performance, in particular, has gained prominence in today's dynamic work environments where technological change and innovation are constant.

Recent studies highlight that cognitive ability, personality traits, and emotional intelligence are enduring interpreters of job performance. Demonstrated that overall cognitive ability is the strongest predictor of job performance across a wide range of occupations. However, non-cognitive factors such as conscientiousness, emotional resilience, and a willingness to embrace new experiences also meaningfully influence performance (Salgado, 1997). In addition, emotive intelligence, particularly the capability to regulate feelings and manage interpersonal relationships, has been shown to enhance performance, especially in service-oriented roles (O'Boyle et al., 2011). In organizational settings, performance is also shaped by job performance, engagement, and psychological empowerment (Bakker & Demerouti, 2008). Work environment factors, including leadership, organizational support, and resource availability, critically influence performance outcomes. For example, employees working under transformational leaders often report higher engagement, creativity, and performance.

Ng et al. (2009) Cultural factors also influence job performance, especially in collectivist societies where teamwork, interpersonal harmony, and authority respect are valued. In countries like Pakistan, where hierarchical organizational structures are common, job performance may be more strongly linked to loyalty and group cohesion than to individual initiative alone (Shahzad et al., 2008).

Moreover, Arslan et al. (2022) discovered that various dimensions of artificial intelligence are associated with workplace challenges such as job pressure, anxiety, stress, agitation, low mood, and irritability. They suggested that these effects of AI implementation could have an impact on overall employee productivity. Such effects may impact morale, either positively or negatively, which in turn can significantly affect individual performance.

The research evaluated the job effectiveness of librarians employed at higher education institutions across Khyber Pakhtunkhwa using a standardized instrument developed by Goodman and Svyantek (1999). The results revealed that overall job performance among librarians was good. Respondents demonstrated strong performance in key areas such as planning and organizing work to meet deadlines, punctuality, and collaboration with colleagues. Comparatively lower performance was observed in behaviors such as taking initiative in unofficial functions and providing innovative suggestions. The lowest ratings were reported for negative workplace behaviors, including taking undeserved breaks and engaging in personal calls during work hours.

Job performance is widely acknowledged as a key factor influencing employee performance, especially within academic and service-oriented professions. Khan, Ahmad, & Rana (2023) conducted a study to examine how job performance impacts the performance of librarians in higher education institutions across Khyber Pakhtunkhwa. Their research identified a significant positive relationship between job satisfaction and job performance, indicating that librarians who are more satisfied with their roles tend to perform their duties more effectively. This trend was observed across various institutional types, underscoring the broad relevance of job performance as a motivational driver. The study highlighted critical elements contributing to satisfaction, such as recognition, a supportive work environment, and opportunities for professional development. Based on these findings, Shahzad and Khan (2024) are especially important in today's rapidly evolving academic landscape, where librarians are expected to be both innovative and adaptable to meet the growing demands placed on library services.

METHODOLOGY

This research utilized a quantitative research design. The target population consisted of librarians working in different universities in KP (Private and Public sectors). The probable Number of librarians working in all these university libraries became 109 (Khan et al., 2023). A stratified proportionate random sampling method was used to ensure balanced representation across all identified strata. Stratified sampling involves dividing the population into distinct, homogeneous subsections (strata) based on specific characteristics, from which random samples are then drawn. This approach enhances sampling efficiency and ensures that each subgroup is adequately represented, thereby allowing for meaningful comparisons between groups. To ensure randomness, the lottery method was used to select participants from each stratum. The overall sample size was determined using Raosoft's sample size calculator, yielding 86 respondents. The sample size for each stratum was calculated using this formula:

(Sample Size / Population Size) × Stratum Size.
 Detailed information regarding the sample distribution is presented in Table 1 below:

Table 1: Strata-Wise Analysis

S.No	Designation	No of Population	No of Sample
01	Assistant librarians	65	51
02	Deputy librarians	33	26
03	Chief librarians	11	09
	Total	109	86

The Survey method was used to gather data from university librarians in Khyber Pakhtunkhwa. A structured questionnaire was prepared and distributed to gather information on respondents' attitudes towards AI literacy and its perceived effects on their job performance. The questionnaire included closed-ended items using a Likert scale to ensure consistency and ease of statistical analysis. Data was collected either in person or electronically, depending on accessibility and convenience for participants. From the group of Assistant Librarians, 51 were selected from the list prepared under their names. In the case of Deputy Librarians, 26 participants were selected through a list-based procedure, while 9 Chief Librarians were selected from their respective lists using the lottery method. In this way, a total of 86 respondents were chosen as the study sample from the overall population of 109 librarians. This stratified proportionate random sampling approach allowed the study to maintain a balance across different librarian designations, ensuring balanced representation of strata.

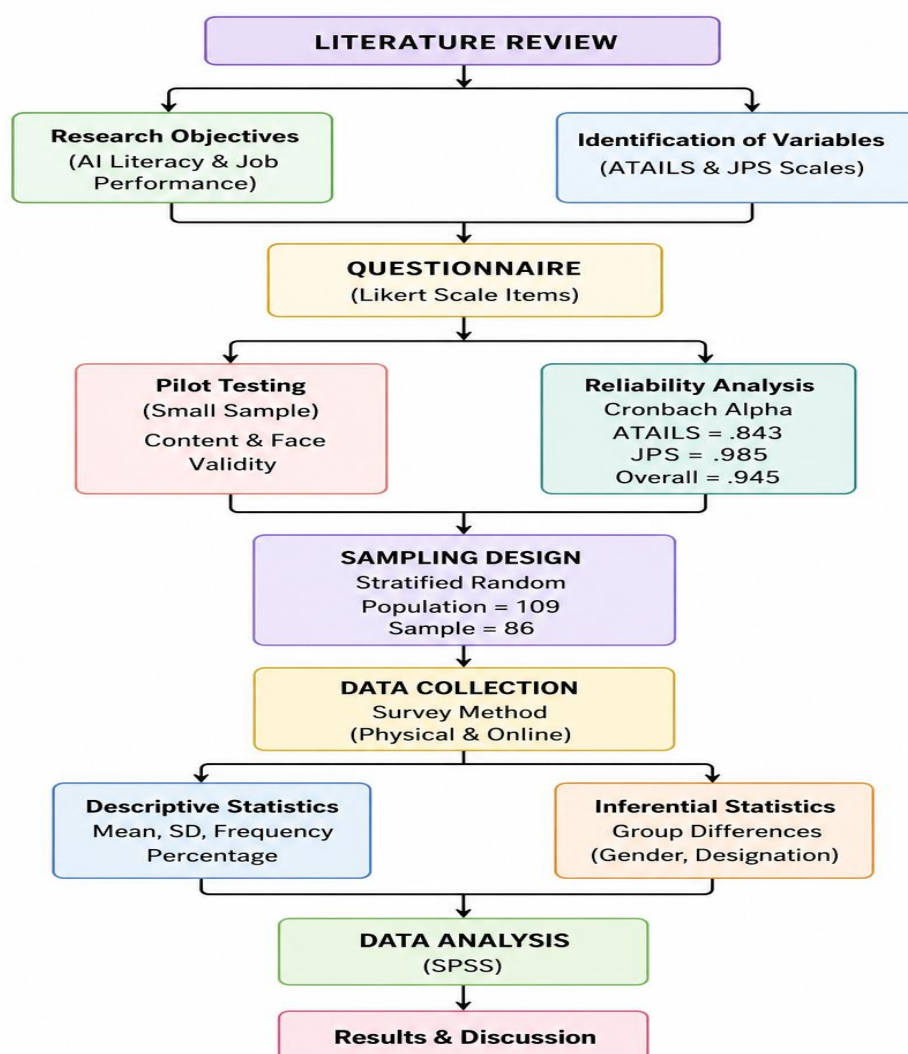
The gathered data were examined using various statistical techniques. Descriptive statistics such as means, standard deviations, frequencies, and percentages were utilized to effectively organize and display the information. In addition, inferential statistical techniques were applied to examine differences based on gender, job designation, and institutional affiliation. SPSS was used to perform all analyses.

Reliability Analysis

A reliability analysis was performed to evaluate the internal consistency of the two individual scales ATAILS and JPS, as well as the overall, i.e, combined scale. The ATAIL scale, consisting of 22 items, demonstrated good reliability with of .843, indicating a high level of internal consistency among the items within the scale. The JPS scale, which includes 11 items, showed excellent reliability, with a Cronbach's alpha of .985, suggesting an exceptionally strong internal consistency. When the items from both scales were combined to form an overall scale comprising 33 items, the analysis yielded a Cronbach's alpha of .945, which also indicates excellent reliability. These results confirm that the items within each scale, as well as the combined set, consistently measure the underlying constructs, making them suitable for further analysis and interpretation.

Table 2: Reliability statistics of the scales used

S.No	Scale	No of Item	Alpha Value
01	ATAILS	22	.843
02	JPS	11	.985
03	Overall	33	.945



The overall research design and methodology of this study are depicted in Figure 1.

Data Screening and Response Rate

Before data analysis, all returned questionnaires were checked for completeness and accuracy. Of the 86 questionnaires distributed, 65 were returned. Among these, 3 were found to be incomplete. Consequently, 62 fully completed and valid questionnaires were considered for the final analysis. The response rate was 72%. This relatively high response rate enhances the reliability of the study and supports the generalizability of its findings. A strong response rate minimizes the potential for non-response bias and indicates that the collected data is likely reflective of the target population.

Demographic Information of Respondents

Table 3 shows that the age distribution of the respondents reveals that the largest portion, 53.2% (33 individuals), belongs to the 25-34 age group. This is followed by the 35-44 age group, comprising 17 respondents or 27.4% of the total. The smallest segment consists of those aged 45-55, with 12 individuals

representing 19.4%. The gender distribution of the respondents shows that the majority were male, with 41 individuals making up 66.1% of the total sample. Female respondents accounted for 21 participants, representing 33.9%. The Data on institutional affiliation shows that the majority of respondents, 43 individuals, representing 69.4%, belong to public institutions. Meanwhile, 19 respondents, or 30.6%, are affiliated with private institutions. The designation data indicate that the majority of the respondents hold the position of Assistant Librarian, with 55 individuals making up 88.7% of the total sample. This is followed by Deputy Librarians, who account for 5 respondents or 8.1%. The smallest group consists of chief Librarians, with only 2 individuals representing 3.2% of the participants.

Table 3: Demographic Profile

Respondents Information	Scale	Frequency	Percent
Age	25-34	33	53.2
	35-44	17	27.4
	45-55	12	19.4
Gender	Male	41	66.1
	Female	21	33.9
Type of Institutions	Public	43	69.4
	Private	19	30.6
Designation	Assistant librarian	55	88.7
	Chief librarian	2	3.2
	Deputy librarian	5	8.1
Total		62	100.0

Major Findings

University Librarians' Attitude towards AI Literacy

Table 4 presents the mean scores and standard deviations for 22 statements assessing participants' attitude towards artificial intelligence literacy. High-scoring Areas (Mean > 4.0) for which participants demonstrated Strong agreement and high self-reported competence in basic understanding and perception of AI included the items on the scale, such as "I know the definitions of artificial intelligence" (M = 4.61, SD = 0.491), indicating broad foundational awareness. Items such as "I can imagine a possible future by using AI" (M = 4.48) and "I can assess the advantages and disadvantages the use of an artificial intelligence entails" (M = 4.24) also scored highly, suggesting forward-thinking attitudes and critical reflection on AI's impact. Several practical usage items, such as "I use AI applications to simplify my daily routine time" (M = 4.05) and "In everyday life, I can interact with AI in a way that makes my tasks easier" (M = 4.15), showed strong agreement, reflecting familiarity and comfort in applying AI to daily tasks. Moderate Scoring Areas (Mean 3.0-3.9) observed in ethical awareness and ability to critically assess AI covered the following: Item like "I can weigh the consequences of using AI for society" (M = 3.92) and "I can incorporate ethical considerations when deciding whether to use AI-provided data" (M = 3.71) suggest developing but not yet fully confident ethical competencies. Participants showed average confidence in distinguishing between AI and human interaction (M = 3.77) and in evaluating AI tools for ethical implications (M = 3.21). Low Scoring Areas (Mean < 3.0) items related to technical proficiency and creation of AI applications received the lowest ratings: "I can develop new AI applications" (M = 2.02), and "I can program new applications in the field of AI" (M = 1.98) reflect a significant gap in advanced AI programming skills. This suggests that while participants are comfortable using AI, they lack the specialized training or confidence required to build or program AI systems.

Table 4: Descriptive Analysis of University Librarians' Attitude towards AI Literacy

Statements	Mean	Std. Dev.
I know the definitions of artificial intelligence.	4.61	.491
I can imagine possible future by using AI.	4.48	.593
I can assess the advantages and disadvantages the use of an artificial intelligence entails.	4.24	.534
I can assess the possible limitations and opportunities of AI.	4.19	.596
I can use artificial intelligence meaningfully to achieve my everyday goals.	4.16	.853
In everyday life, I can interact with AI in a way that makes my tasks easier.	4.15	1.069
I can identify devices that use AI from devices that do not.	4.11	.791
AI has a positive impact on students, academic performance.	4.10	.936
I can come up with creative ways to use AI.	4.08	.417
I am familiar with the most important concepts of the topic "artificial intelligence".	4.06	.624
I use AI applications to simplify my daily routine time.	4.05	.798
I can communicate effectively with artificial intelligence in routine life.	4.03	.511
I am proficient in using AI applications in my daily life.	4.03	.789
I can weigh the consequences of using AI for society.	3.92	.963
In everyday life, I can work together gainfully to achieve my everyday goals.	3.82	.758
I can distinguish if I interact with an AI or a "real human".	3.77	.818
I can incorporate ethical considerations when deciding whether to use AI-provided data.	3.71	.776
I can analyze AI-based applications for their ethical implications.	3.21	1.189
I can select useful tools (e.g., frameworks, and programming languages) to program an AI.	2.58	1.064
I can develop new AI applications.	2.27	1.691
I can design new AI applications.	2.02	1.349
I can program new applications in the field of "Artificial intelligence"	1.98	1.274
Overall status of ATAIL	3.71	.418

Job Performance Level of University Librarians in KP

Table 5 presents descriptive statistics that provide insights into various aspects of employees' perceptions and behaviors in their work environment. The highest mean score ($M = 4.68$, $SD = 0.901$) is associated with the statement "I am proud to be a part of this institution," indicating a strong sense of institutional pride among respondents. This is closely followed by high agreement on "I have the competencies that my job requires" ($M = 4.61$, $SD = 0.912$) and "I am eager to acquire new skills related to my job" ($M = 4.58$, $SD = 0.915$), suggesting that employees feel confident in their abilities and show a willingness to improve professionally. The statement "I work effectively/efficiently" also received a high mean ($M = 4.56$, $SD = 0.917$), reflecting a generally positive self-assessment of productivity. Additionally, respondents showed a strong tendency to support their institution, with "Even if there are criticisms from either inside or outside the institution, I defend my institution" receiving a mean of 4.45 ($SD = 0.918$), and "I contribute to the creation of a positive working environment in my institution" scoring 4.48 ($SD = 0.919$). Statements reflecting teamwork and problem-solving, such as "If I encounter a situation that prevents the task from being done, I try to fix it" ($M = 4.19$, $SD = 0.955$), "I help and encourage my friends to complete their work" ($M = 4.11$, $SD = 0.832$), and "I take extra care and responsibilities while doing my duty" ($M = 4.21$, $SD = 0.871$), show relatively strong agreements but slightly more variability among responses. Lowest Mean ($M = 4.06$, $SD = 0.807$), while "I understand and carry out work-related

procedures” followed closely ($M = 4.31$, $SD = 0.898$). Although these values are still positive, they indicate potential areas for improvement in work organization and procedural clarity.

Table 5: Descriptive Analysis of the Job Performance Level of University Librarians in KP

Statements	Mean	Std. dev.
I have the competencies that my job requires.	4.61	.912
I work effectively/efficiently.	4.56	.917
I understand and carry out work-related procedures.	4.31	.898
I work in a planned and organized manner to complete the task assigned to me fully and on time.	4.06	.807
I am eager to acquire new skills related to my job.	4.58	.915
I take extra care and responsibilities while doing my duty.	4.21	.871
I contribute to the creating of a positive working environment in my institution.	4.48	.919
If I encounter a situation that prevents the task from being done, I try to fix it.	4.19	.955
I help and encourage my friends to complete their work.	4.11	.832
Even if there are criticisms from either inside or outside the institution, I defend my institution.	4.45	.918
I am proud to be a part of this institution.	4.68	.901
Overall status of JP	4.39	.799

Relationship Between the University Librarians’ Attitude toward AI Literacy and Their Job Performance Level

A Pearson correlation coefficient was calculated to examine the association between overall ATAIL scores and overall job performance (JP) scores. There was a moderate, positive correlation between the two variables, $r(60) = .58$, $p < .001$, indicating that higher scores on the ATAIL were associated with higher levels of job performance. This relationship was statistically significant at the 0.01 level (two-tailed).

DISCUSSION

The present study reveals that university librarians in Khyber Pakhtunkhwa generally demonstrate a positive attitude toward AI literacy, as evidenced by a high mean ATAIL score ($M = 3.71$, $SD = .418$). This finding aligns with global trends that highlight growing acceptance and awareness of AI technologies among information professionals, especially in roles that require engagement with digital tools and emerging technologies, as in study of Carlous et al. (2023). The researchers found that the participants in their study also reported a positive attitude towards AI, with a mean score of 3.60 ($SD = 0.57$). The narrow score range (3 to 4) and relatively low standard deviation indicate consensus among respondents, suggesting a widespread appreciation of AI’s relevance among participants of the study.

However, the study also highlights critical gaps in more advanced areas of AI literacy. Specifically, participants expressed low confidence in their ability to develop or program AI systems, reflected in mean scores below 2.1. These mirror global findings that, while general awareness and user-level competence are rising, technical development skills remain limited among non-specialist professionals (Wang et. al., 2023; Ng et. al., 2021). The MAELS framework similarly identifies "Create AI" as a distinct construct, not necessarily expected of all users, but essential in advanced AI education and workforce readiness programs.

Moderate scores in ethical awareness and societal implications of AI, such as evaluating AI-driven decisions and distinguishing between AI and human interactions, point to an area of evolving literacy. These aspects correspond to the “Evaluate AI” and “AI Ethics” components of the MAILS model. The findings suggest that while librarians are beginning to engage with critical reflection on AI’s impact, additional training is needed to enhance their ethical discernment and judgment regarding AI-generated content, a concern echoed in recent AI literacy research emphasizing the need for socio-technical awareness (Carolus et. al., 2023).

When evaluating job performance, librarians reported high levels of perceived professional efficacy ($M = 4.39$, $SD = 0.80$), with particularly strong identification with institutional values and competencies required for their roles. These results are consistent with findings from the Job Performance Scale developed by Caliskan and Koroglu (2022), which identified both task and contextual performance dimensions. Respondents in the current study displayed strong contextual commitment, evident in pride in institutional affiliation and proactive engagement with workplace responsibilities. Khan et al, (2023) also reported that job performance of librarians working in higher educational institutions in Khyber Pakhtunkhwa was good, with a mean score of 3.96 ($SD = 0.31$),

Moreover, the moderate-to-strong positive correlation $r(60) = .58$, $p < .001$ between ATAIL scores and job performance scores indicates that librarians with more favorable attitudes toward AI literacy also tend to perceive themselves as more effective in their roles. This supports existing literature that emphasizes the importance of technological adaptability as a determinant of job success in modern information environments (Latikka et. al., 2019; Chai et. al., 2021).

CONCLUSION

This study examined the attitudes of university librarians in Khyber Pakhtunkhwa (KP) toward Artificial Intelligence (AI) literacy and its relationship with job performance. The findings indicate that librarians generally hold positive and progressive attitudes toward AI, demonstrating a solid foundational understanding and a high level of comfort in using AI tools for routine professional tasks such as information retrieval and service efficiency. However, despite this positive engagement, a notable gap exists in advanced technical competencies, particularly in developing or programming AI applications. Statistical analyses further revealed no significant differences in AI literacy and job performance across gender, institutional type, or job designation, suggesting a relatively uniform perception across the librarian population. Importantly, the study identified a statistically significant moderate positive correlation between AI literacy and job performance, highlighting that greater familiarity with AI technologies is associated with enhanced workplace effectiveness.

These findings underscore the importance of strengthening AI literacy among academic librarians through targeted professional development initiatives. Institutions in KP should prioritize structured training programs that not only reinforce basic AI knowledge but also build advanced, hands-on technical skills. While the study reflects a motivated and capable workforce, its limitations, particularly the regional focus and modest sample size, suggest the need for broader and more longitudinal research. Future studies should explore additional factors such as institutional support, access to technological resources, and individual motivation to gain a deeper understanding of AI adoption in libraries. Overall, the study concludes that AI literacy is an essential competency for modern librarians, playing a critical role in enhancing job performance and supporting the ongoing digital transformation of academic libraries.

RECOMMENDATIONS

1. To develop structure AI literacy Training Programs, where academic institutions should design and implement targeted training modules focused on AI literacy for university librarians. These programs should cover both foundational knowledge and practical applications, ensuring librarians can confidently integrate AI tools into their daily work.
2. To incorporate Advanced Technical skills in professional development initiatives offered to university librarians. Beyond basic usage, training should include hands-on workshops on AI-related skills such as data analysis, evaluating AI tools, and introductory programming. This will help bridge the gap in technical proficiency identified among librarians.
3. Develop a culture of Continuous skill development and innovation. The institution would inspire lifelong learning through incentives like professional development credits, certifications, or career advancement opportunities linked to AI skill acquisition and digital transformation competencies.
4. Participate in AI tools in library operations and support services should begin piloting AI-based systems (e.g., for cataloging, user queries, data management) to familiarize staff with real-world use cases and promote innovation in service delivery.
5. Ensure Equal access to AI resources across institutional types to minimize disparities between public and private sector librarians. Governing bodies or academic consortia could provide shared access to training, tools, and AI development initiatives, especially for resource-constrained institutions.
6. Establish Collaborative Learning Communities (ECLC), encourage the formation of librarian networks or peer learning groups focused on AI, where librarians can share best practices, challenges, and emerging trends to collectively improve digital competencies.
7. Monitor and evaluate AI training outcomes implements evaluation mechanisms to assess the effectiveness of AI literacy programs, including pre- and post-training assessments, feedback surveys, and impact analysis on job performance metrics.

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