

ASSESSING THE CORRELATION AMONG AI LITERACY, DIGITAL ACCESS, AND WORK READINESS: A QUANTITATIVE APPROACH*

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Abstract

This research article aimed to examine the relationship between digital tools usage and AI-related technologies and students' work readiness for workforce entry, investigate the relationships among components of AI literacy and students' work readiness in higher education, and examine the interplay of psychological, behavioral, and skill-based factors including technical skills, digital skills, hard skills, soft skills, and self-efficacy with AI literacy in shaping overall work readiness. A quantitative research design was employed, collecting data from 251 fourth-year university students through an online questionnaire. The data were analyzed using descriptive statistics and Spearman's correlation analysis.

The results revealed that digital tools usage and engagement with AI technologies were modestly but significantly associated with students' work readiness. AI literacy functioned as a multidimensional construct encompassing

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cognitive, ethical, and technical competencies and demonstrated a significant relationship with work readiness, although its influence was weaker than that of core human skills. Soft skills, problem-solving abilities, technical competence, and self-efficacy emerged as the strongest predictors of perceived work readiness. The findings suggest that while AI literacy is an important supplementary competency, essential human skills remain central to employability. Embedding AI literacy within broader human-centered and ethical skill development frameworks may provide the most effective approach for preparing graduates for technology-driven work environments.

Keywords: AI literacy, digital access, soft skills, employability, work readiness

Introduction

Artificial intelligence (AI) is transforming education, impacting teaching methodologies, learning experiences, evaluation procedures, and policy structures. In higher education, generative AI increases pedagogical methods, promoting greater instructional efficacy, student engagement, and academic achievement. This technological advancement also prompts ethical considerations, especially related to transparency, equity, and bias (Joseph, 2025; Deepshikha, 2025). Globally, governments are progressively promoting AI in education (AIEd) regulations that emphasize ethics, teacher readiness, and equal access. In nations like China, Singapore, and the United States illustrate these priorities, acknowledging AI for educational and economic advancement in developed economies (Kundu & Bej, 2025; Abid, 2025). In these developments, AI literacy has become an essential skill for students operating inside AI-enhanced educational and professional environments. Studies indicate that digital literacy, AI competencies, and perceptions of AI substantially impact academic achievement, learning results, self-efficacy, adaptability, and work readiness (Hamouche et al., 2025; MacLennan et al., 2025). As AI transforms workplaces,

individuals must cultivate learning agility and adaptable behaviors to succeed in AI-enhanced environments, hence reinforcing the link between AI literacy and professional preparedness (Rastogi & Pandita, 2025).

Despite the growing of research on digital literacy and AI integration in education, limited studies have investigated the interplay between AI literacy and psychological, behavioral, and skill-related aspects in forecasting students' work readiness. Prior research has highlighted the significance of digital competencies, AI education, mindsets, and adaptability in AI-centric work environments (Hamouche et al., 2025; MacLennan et al., 2025; Rastogi & Pandita, 2025), although these elements have not been synthesized into a cohesive framework. This vacuum in the literature prompts the present study, which aims to investigate the interrelationships between AI literacy and related characteristics in forecasting work readiness among higher education students.

Objectives

1. To examine the relationship between digital tools usage and the AI-related technologies and student's work readiness for workforce entry.
2. To investigate the relationships among components of AI Literacy and student's work readiness in higher education.
3. To examine the interplay of psychological, behavioral, and skill-based factors including technical skills, digital skills, hard skills, soft skills, and self-efficacy with AI literacy in shaping overall work readiness.

Literature Review

Artificial Intelligence (AI) Literacy and Digital Proficiency

AI literacy is increasingly recognized as a core component of digital competence supporting academic success and future employability. Research

indicates that AI-related knowledge, skills, and attitudes significantly affect students' effective use of digital tools and learning outcomes (MacLennan et al., 2025). While digital literacy enhances creativity, problem-solving, adaptability, and workforce-related skills (Hamouche et al., 2025). AI literacy plays a crucial role in preparing learners for AI-driven environments.

Psychological and Behavioral Preparedness for AI-Driven Work

Work readiness in the digital age extends beyond technical skills to include psychological preparedness, learning adaptability, and adaptive behaviors. AI-driven workplaces require continuous learning, proactive adaptation, and effective interaction with digital systems. Research highlights that learning agility and digital self-determination are critical for success in AI-integrated roles (Rastogi & Pandita, 2025). Similarly, Industry 5.0 transformations emphasize the importance of human-centered digital flexibility as organizations progress toward AI-integrated processes (Pham & Li, 2025).

AI Competencies and Workforce Readiness in Developing Digital Ecosystems

The rapid advancement of artificial intelligence in business and industry highlights the importance of AI infrastructure readiness, AI-driven decision-making, and digital innovation ecosystems in shaping employability (Chotia et al., 2025). Simultaneously, digital transformation increases expectations for employees digital proficiency and ability to manage complex systems (Christofi - et al., 2025). These insights demonstrate that AI literacy constitutes a fundamental prerequisite for preparedness in the contemporary labor market.

Methodology

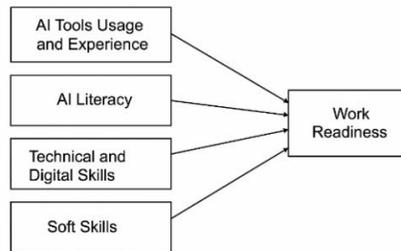
Population and sample

The population comprised fourth-year university students, approximately 4,000 individuals. This group was chosen because of their entry into the workforce, that suitable for investigating factors work readiness and AI literacy.

The null hypothesis specified as $H_0: r = 0$. To establish the minimum sample size, an a priori power analysis was performed utilizing G*Power 3.1. The parameters comprised a medium effect size of $r = 0.30$ (Cohen, 1988), a significance level of $\alpha = 0.05$, and a statistical power of $1 - \beta = 0.80$, the minimum required sample size was 84 participants. In practice, the study obtained 251 valid responses, This larger sample size enhances statistical precision and improves the stability finding of sampling population.

Research instruments

The questionnaire consisted of five groups. The first group, AI Tools Usage and Experience, examined students' engagement with digital and AI technologies. The second, AI Literacy, based on the frameworks of Long and Magerko (2020) and Zhao et al. (2022). The questions consist of cognitive, practical, ethic, AI knowledge and attitudes toward AI. The third, Technical and Digital Skills, evaluated technology competencies for employment, including technical, digital, and hard skills. The fourth, Soft Skills, focused on non-technical employability attributes such as communication, problem-solving, work ethic, and self-efficacy. The final group, Work Readiness, measuring students perceived work readiness, items adapted from Caballero et al. (2011), sections 2–5 used a five-point Likert scale.



Data collection

The data for this study were collected through online questionnaire administered to fourth-year university students.

Data analysis

The data were examined utilizing descriptive statistics and Spearman's correlation analysis. Descriptive statistics were initially employed to summarize the demographic, AI literacy, skill-based, and employment ready factors. Spearman's correlation analysis was performed to investigate the correlations among the utilization of AI tools, AI literacy, talents (including both technical and soft skills), and work readiness.

Results

Descriptive statistics were computed for all demographic, AI literacy, skills, and outcome variables. An average GPA of 3.54 (SD = 0.97), Interaction with AI-related technologies, characterized by moderate levels of general computer usage (M = 2.20, SD = 0.67) and laboratory access (M = 2.08, SD = 1.10). Conversely, the employment of AI tools (M = 4.34, SD = 1.02). AI literacy indicators exhibited moderate to high competence in knowledge, application, critical, and ethical considerations, along by attitudes about AI. The dependent variable, work readiness, produced a mean score of 115.78 (SD = 18.18).

Table 1 Correlations Between Digital tools usage, experience and Work Readiness

	Spearman's Rho	n
1. Computer Use	.154**	251
2. Lab Use	-0.067**	251
3. AI Frequency	.109*	251
4. AI Experience	.0084	251

Table 1 shows correlation indicated that computer usage had a modest but statistically significant positive correlation with work readiness ($r = .154$, $p < .01$). The frequency of AI demonstrated statistically significant positive correlation with work readiness ($r = .109$, $p < .05$). Conversely, laboratory use showed a small and non-significant negative correlation with work readiness ($r = -.067$), but prior AI experience revealed a slight yet non-significant positive link ($r = .084$).

Table 2 Correlations Between AI Literacy and Work Readiness

	Spearman's Rho	Sig. (2-tailed)	n
1. AI Knowledge	.620**	< .001	251
2. AI Application	.690**	< .001	251
3. AI Critical Thinking	.719**	< .001	251
4. AI Ethics	.653**	< .001	251
5. Attitude Toward AI	.645**	< .001	251

** . Correlation is significant at the 0.01 level (2-tailed).

Table 2 shows the relationships between components of AI literacy and work readiness. AI literacy consists of AI knowledge, application, critical thinking, ethics, and attitudes toward AI, exhibited significant correlation with work readiness. The most robust correlation was AI critical thinking ($r = .719$, $p < .01$), followed by AI

application ($r = .690, p < .01$), AI ethics ($r = .653, p < .01$). Attitude toward AI ($r = .645, p < .01$) and AI knowledge ($r = .620, p < .01$).

Table 3 Strong Positive correlation Between Study Variables and Work Readiness

Variable Pair		Spearman's Rho	Sig. (2-tailed)	n
Soft Skill	Problem-Solving	.929**	< .001	251
	Work Ethic	.913**	< .001	251
	Self-Efficacy	.908**	< .001	251
	Communication	.906**	< .001	251
Hard Skill	Digital Skill	.940**	< .001	251
	Technical Skill	.920**	< .001	251
AI Literacy	Soft Skill	.781**	< .001	251
	Hard Skill	.755**	< .001	251
	Digital Skill	.755**	< .001	251
	Technical Skill	.725**	< .001	251
Work Readiness	Soft Skill	.983**	< .001	251
	Hard Skill	.919**	< .001	251
	Self-Efficacy	.900**	< .001	251
	Communication	.899**	< .001	251
	Work Ethic	.882**	< .001	251
	Technical Skill	.879**	< .001	251
	Digital Skill	.862**	< .001	251
	AI Literacy	.800**	< .001	251

Table 3 shows the strong positive correlations between work readiness and soft skills ($\rho = .983, p < .001$). Work readiness had a strong relationship with hard skills ($\rho = .919$), self-efficacy ($\rho = .900$), communication skills ($\rho = .899$), work ethic ($\rho = .882$), technical skills ($\rho = .879$), and digital abilities ($\rho = .862$), all at $p < .001$.

Moreover, hard skills had significant correlations with digital skills ($\rho = .940, p < .001$) and technical skills ($\rho = .920, p < .001$).

Discussion

The findings from research objective 1, shows interaction with digital tools and AI technology is moderately correlated with students' readiness for the workforce. Consistent computer usage and regular engagement with AI tools foster basic technological proficiency; yet, their restricted impact indicates that mere digital access is inadequate for significantly improving employability. This corresponds with previous studies highlighting that digital exposure should be combined with advanced skills to significantly impact work readiness in technology-driven settings (Joseph, 2025; Abidi et al., 2025).

The findings of research objective 2, AI literacy functions as an integrated, multidimensional construct encompassing cognitive, ethical, and technical competencies, consistent with sociotechnical perspectives (Bridges et al., 2025). Although AI literacy was significantly related to work readiness, the strength of this relationship was comparatively weaker than those observed for core human skill domains. This interpretation aligns with prior research indicating that AI-supported learning primarily enhances surface-level performance and efficiency, while contributing less directly to higher-order reasoning, collaboration, and adaptability that are critical for workplace readiness (Vu & Vu, 2025). Consequently, AI literacy appears to support work readiness indirectly by complementing broader skill development rather than serving as a primary determinant of employability.

The findings of research objective 3 The results demonstrate that psychological, behavioral, and skill-based aspects are crucial in determining overall work readiness in AI-integrated environments. Soft abilities—such as

communication, flexibility, and interpersonal efficiency— have found to be the most significant factors in work readiness, highlighting the critical role of non-cognitive skills in employability (Petreski et al., 2025; Björck et al., 2025). The robust correlations between hard, technical, and digital skills underscore the integrated character of the applied competencies necessary in Industry 4.0 settings (Alkhatib et al., 2025). Work readiness was significantly related to problem-solving skills and self-efficacy, thus supporting multidimensional models of employability (Arianpoor & Abdollahi, 2025). While AI literacy was significantly related to these factors, its influence appeared complementary, suggesting that AI-related competencies are most effective when embedded within robust human skill frameworks (Tomar, 2025).

Conclusion

The findings of this study demonstrate that core human competencies particularly soft skills, problem-solving abilities, technical competence, and self-efficacy are the most influential predictors of students' work readiness. These findings support current employability studies that highlight the persistent significance of interpersonal skills, adaptation, and resilience in evolving, technology-oriented workplaces (Björck et al., 2025). Despite rapid developments in digital technologies and AI, the capacity for effective communication, effective collaboration, and confident engagement with difficult tasks remains important for successful workforce integration.

Although AI literacy is increasingly recognized as a critical capability in contemporary educational and professional contexts, its comparatively weaker association with work readiness suggests that it serves a complementary rather than substitutive role. In accord with previous studies, AI-related abilities provide greatest efficiency when included into strong human skill frameworks that prioritize ethical awareness, cognitive flexibility, and adaptability (Tomar, 2025).

Higher education institutions should focus comprehensive skill development by integrating AI literacy into broader curricular methods that enhance fundamental human competencies, thus equipping graduates to address changing workforce demands and future career challenges.

Recommendation

Policy Recommendations

Educational institutions ought to prioritize the improvement of AI literacy alongside the development of soft skills. Given the strong correlation between soft skills such as communication, problem-solving and work readiness, it is essential to integrate these skills into curricula. Furthermore, universities ought to enhance access to AI tools and resources that students to acquire practical experience. Policies must focus on a balance between technical and non-technical skills to prepare students for the changing workforce.

Suggestions for Future Research

Future research should investigate the enduring effects of AI literacy on professional achievement. Investigations may also examine the impact of AI literacy on diverse industries and professional roles.

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