

AI Learning Attitudes and AI Literacy Among Community Adult Learners: Social Implications in the Context of Digital Transformation

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ABSTRACT

In the context of rapid population aging and digital transformation, artificial intelligence (AI) is rapidly reshaping social development, individual learning, and patterns of social participation. The trajectory of social progress and transformation is closely associated with the development of AI applications and related competencies among the general public. However, uneven development of AI capabilities may further exacerbate digital inequalities among adult learners. This study aims to provide a preliminary exploration of AI learning attitudes and AI literacy among community adult learners in Taiwan, and to examine their implications for digital inclusion and future development in an aging society. The study recruited 170 adults from northern Taiwan who participated in community-based AI learning programs. Data were collected using structured questionnaires and analyzed through descriptive statistics and Pearson's correlation analysis. The results indicate that participants generally demonstrated highly positive AI learning attitudes, while their levels of AI literacy were comparatively lower, revealing a gap characterized by "high motivation but low competence." In addition, a significant positive correlation was found between AI learning attitudes and AI literacy, suggesting that learning attitudes serve as an important motivational foundation for AI literacy. However, attitudes alone are insufficient to facilitate substantial improvement in competencies. The findings suggest that enhancing AI literacy requires the integration of systematic instructional design and practice-oriented training in order to support the transformation of learning motivation into actual competencies. Furthermore, the study highlights the importance of promoting digital inclusion and social participation in aging societies, offering important implications for future community education and social development.

INTRODUCTION

In the context of rapid globalization and digital transformation, contemporary societies are increasingly confronted with structural challenges associated with population aging and the growing demand for healthcare services. These challenges have prompted a shift toward community-based approaches that emphasize cross-sector collaboration, mutual support, and co-care models in order to build adaptive and sustainable resilient communities. In this regard, community-based co-care has emerged as a critical strategy for enhancing health literacy, strengthening social cohesion, and addressing the complex needs of aging populations. The implementation of community co-care highlights the importance of cross-disciplinary, intergenerational, and cross-group collaboration. Through mechanisms of self-help, mutual aid, and collective engagement, individuals are encouraged to actively participate in community affairs and contribute their knowledge and expertise. Such participatory approaches are particularly important in addressing pressing social issues, including population aging, declining

birth rates, shortages in the care workforce, and the increasing number of older adults living alone. Alongside these developments, the rapid advancement of artificial intelligence (AI) has introduced new possibilities for transforming community learning, health promotion, and social services. AI technologies, with their capacity for data processing, personalization, and real-time feedback, are increasingly integrated into community settings to enhance educational innovation, optimize resource allocation, and support health-related decision-making (Frehywot et al., 2023). These developments not only reshape community governance but also influence how individuals learn, interact, and engage in society.

Existing studies have identified several domains in which artificial intelligence (AI) contributes to community development, including health promotion, educational innovation, social services, and community resilience building. Recent research indicates that AI can enhance access to health information and support community-based interventions, thereby improving health literacy and informed decision-making (T'baishat, 2025; Abeo, 2025). In the field of education, AI-driven learning environments enable personalized learning pathways based on learners' behavioral data, which are particularly beneficial for adult and older learners (Luckin et al., 2016). Furthermore, microlearning approaches, which deliver knowledge in small and manageable units, have been recognized for their effectiveness in enhancing learning efficiency and reducing cognitive load. Emerging evidence indicates that AI-enhanced microlearning systems can facilitate adaptive, personalized, and inclusive learning experiences, thereby improving learner engagement, knowledge acquisition, and educational equity (Ng et al., 2023; Fadli, 2025).

In addition to educational and health-related applications, AI has also been increasingly utilized in mental health support and social services. AI-based conversational agents, for example, can provide emotional support and deliver timely interventions through natural language processing (Fitzpatrick et al., 2017). In social service contexts, AI applications contribute to improving service efficiency and optimizing resource allocation (Abeo et al., 2025). These advancements highlight the growing role of AI in shaping both individual capabilities and broader social structures.

Despite these promising developments, concerns have emerged regarding the uneven distribution of AI-related competencies. While AI technologies offer opportunities to enhance learning and social participation, disparities in access, skills, and usage may lead to new forms of digital inequality, particularly among adult learners in community settings. Previous research suggests that although adult learners often demonstrate strong motivation to engage with emerging technologies, their actual competencies may remain limited due to insufficient learning opportunities, lack of structured training, and limited practical experience. In the context of aging societies, this gap between motivation and competence is especially critical, as digital competence is increasingly linked to individuals' ability to access information, participate in community life, and maintain overall well-being. Therefore, understanding the relationship between AI learning attitudes and AI literacy is essential for developing effective community-based educational strategies that support digital inclusion and social participation.

Accordingly, this study aims to examine the current status of AI learning attitudes and AI literacy among community adult learners in Taiwan, and to explore the relationship between these variables. By identifying potential gaps and underlying dynamics, this study seeks to contribute to the broader discussion on digital transformation, community learning, and social change in aging societies.

LITERATURE REVIEW

In the era of rapid advancement in artificial intelligence(AI), continuous engagement with emerging technologies and the development of application-related competencies have become increasingly essential in both professional and everyday contexts. AI literacy as a skill that enables people to understand and identify the AI solutions, tools, methods, and algorithms in the diversity of AI applications(Polomoshnov et al., 2026). A growing body of research has demonstrated that AI applications can effectively support adult learning processes (Kang, 2023; Storey et al., 2024). For individuals engaged in health promotion and care—whether directly or indirectly involved in healthcare delivery—AI-related competencies are no longer optional but have become core professional skills. The ability to apply AI technologies and interpret analytical outputs to inform health promotion strategies and policy decision-making is increasingly indispensable in contemporary practice, as AI systems are now widely used to support public health surveillance, resource allocation, and evidence-based decision-making (Panteli et al., 2025).

Artificial intelligence (AI) transforms healthcare data collection, analysis, and application, making AI proficiency a growing necessity across health professions (Dolezel et al., 2026). For adult learners, AI-enabled personalized support has been recognized as a promising approach to enhance learning efficiency and engagement by providing adaptive and learner-centered experiences (Ng et al., 2023). Such personalized learning approaches not only improve learning outcomes but also increase adaptability in everyday life. In recent years, the widespread adoption of large language models (LLMs), such as ChatGPT, has further created new opportunities to enhance

learning motivation and stimulate creativity among adult learners (Storey et al., 2024). These technological developments are fundamentally reshaping both formal and informal learning environments.

Reports from public health institutions have also highlighted the potential of AI to improve healthcare efficiency and outcomes, although the magnitude of these effects may vary depending on context and implementation (UNESCO, 2021). In countries such as Japan and South Korea, AI technologies have been increasingly integrated into elder care systems, including the establishment of national-level AI care centers aimed at improving the quality of community-based living and health management for older adults. Similarly, China has actively promoted AI-enabled community-based elderly care services by integrating the Internet of Things (IoT), big data analytics, and smart technologies to deliver personalized home-based care (Zhao et al., 2024).

Against the backdrop of rapid advancements in the internet, big data, cloud computing, and AI, community education is undergoing significant transformation. By integrating principles of community development and systematically designing targeted interventions, it is possible to expand the scope and depth of community education and foster stronger integration among community, school, and family systems. In this context, community practitioners are encouraged to promote smart aging initiatives, develop AI competencies, and enhance AI literacy to improve health promotion practices. This includes strengthening pattern recognition, operational efficiency, and data-driven decision-making through the integration of clinical and community-level data (Sun et al., 2026; Liyanage et al., 2019; Rahimi et al., 2021), ultimately reinforcing the implementation of community-based co-care models.

Despite these advancements, existing studies have primarily focused on the applications and potential benefits of AI, while relatively limited attention has been paid to how adult learners develop AI-related competencies in real-world community settings. In particular, the relationship between AI learning attitudes and AI literacy remains underexplored. Understanding this relationship is crucial for addressing digital inequality and promoting effective participation in the digital society.

METHOD

Research Design and Participants

This study adopted a cross-sectional research design and employed purposive sampling. A total of 12 communities in Taipei City were selected as research sites to examine adult learners' AI learning attitudes and AI literacy across different dimensions. Participants were required to meet the following inclusion criteria: (1) aged 20 years or older; (2) no visual or hearing impairments, no diagnosed psychiatric disorders, and no severe language comprehension difficulties; and (3) willingness to participate in the study and attend the "AI-assisted collaborative learning and health microlearning program." Prior to participation, an orientation session was conducted to ensure that all participants fully understood the research objectives, procedures, and their rights. Informed consent was obtained from all participants. A total of 170 participants were included in the final sample.

Instruments

The instruments used in this study included an AI literacy scale and an AI learning attitude scale, designed to assess community adult learners' AI-related competencies and their learning attitudes. Both instruments were developed based on a comprehensive review of relevant international literature and were evaluated by a panel of experts to establish content validity. Necessary revisions were made prior to formal data collection. The AI literacy scale was developed with reference to established frameworks of digital and AI literacy (Wang et al., 2023). It employed a seven-point Likert scale and comprised four dimensions: cognition, application, evaluation, and ethics, with a total of 12 items. The overall Cronbach's alpha coefficient was 0.83, and the reliability coefficients for the four dimensions ranged from 0.73 to 0.78, indicating good internal consistency. The AI learning attitude scale was developed based on prior studies on technology-enhanced learning and AI-related education (Davis, 1989; Ng et al., 2023). It consisted of 11 items designed to measure participants' cognitive, affective, and behavioral tendencies toward AI learning. The Cronbach's alpha coefficient for this scale was 0.81, indicating satisfactory reliability.

RESULT

Descriptive Summary of Demographic Characteristics

As shown in Table 1, the sample consisted of 170 participants, with a predominance of females (85.29%) compared to males (14.71%). In terms of age distribution, the majority of participants were older adults, with 41.42% aged 65–74 and 31.95% aged 75–84, indicating that over 70% of the sample was aged 65 and above.

Regarding marital status, most participants were married (84.12%), while smaller proportions were single (4.71%), divorced (4.12%), or categorized as other (7.06%). In terms of educational attainment, the largest group had a college or university education (41.76%), followed by senior high school or vocational education (21.18%) and elementary school or below (20.00%). With respect to digital experience, more than half of the participants reported having over five years of computer experience (52.69%) and internet experience (57.74%). However, a notable proportion of participants had limited digital exposure, with 32.93% reporting less than one year of computer experience and 27.38% reporting less than one year of internet experience. Overall, the sample was characterized by a predominantly female, older adult population with diverse educational backgrounds and varying levels of digital experience.

Table 1 Distribution of Demographic Characteristics of Participants (N=170)

Variable	Category	n	%
Gender	Male	25	14.71
	Female	145	85.29
Age	45–54	1	0.59
	55–64	22	13.02
	65–74	70	41.42
	75–84	54	31.95
	≥85	22	13.02
Marital Status	Married	143	84.12
	Single	8	4.71
	Divorced	7	4.12
	Other	12	7.06
Education Level	Elementary school or below	34	20.00
	Junior high school	19	11.18
	Senior high school / vocational	36	21.18
	College / university	71	41.76
	Graduate school or above	10	5.88
Computer Experience	≤1 year	55	32.93
	1–2 years	7	4.19
	3–4 years	17	10.18
	≥5 years	88	52.69
Internet Experience	≤1 year	46	27.38
	1–2 years	5	2.98
	3–4 years	20	11.90
	≥5 years	97	57.74

Descriptive Statistics

Descriptive statistics were conducted to assess the levels of AI learning attitudes and AI literacy among community adult learners. As presented in Table 2, the mean score for AI learning attitudes was 43.48 (SD=6.03), suggesting an overall positive orientation toward AI-related learning. In comparison, the mean score for AI literacy was 39.95 (SD=5.16), indicating a relatively lower level of competence. This discrepancy highlights a potential gap between learners' motivational disposition and their actual skill levels. Specifically, while participants demonstrated favorable attitudes toward engaging with AI, their practical understanding and application of AI-related knowledge appeared to be comparatively limited. This pattern suggests the presence of a motivation–competence gap in AI learning among community adult learners.

Correlation Analysis

Pearson's product–moment correlation analysis was conducted to examine the association between AI learning attitudes and AI literacy. As shown in Table 3, a statistically significant positive correlation was found between the two variables ($r = 0.184$, $p = 0.016$). Despite reaching statistical significance, the magnitude of the correlation was small, indicating a weak association between learners' attitudes and their AI literacy levels. This finding suggests that although positive attitudes toward AI learning may contribute to the development of AI literacy, such attitudes alone are unlikely to produce substantial improvements in competence. Taken together, these results imply that AI learning attitudes function as an initial motivational driver; however, the enhancement of AI literacy likely

depends on additional factors, such as access to learning opportunities, prior digital experience, and structured instructional support.

Table 2 Descriptive Statistics of Key Variables (N = 170)

Variable	M	SD	Min	Max
AI Learning Attitudes	43.48	6.03	18.00	56.00
AI Literacy	39.95	5.16	22.00	56.00

Table 3 Pearson Correlation Between AI Learning Attitudes and AI Literacy

Variable	AI Learning Attitudes	AI Literacy
AI Learning Attitudes	-	
AI Literacy	0.184*	-

Note. $p < .05$.

DISCUSSION

The present study aimed to examine the current status of AI learning attitudes and AI literacy among community adult learners, as well as the relationship between these two constructs. The findings revealed that participants demonstrated generally positive attitudes toward AI learning, whereas their levels of AI literacy were comparatively lower. This pattern reflects a structural gap characterized by “high motivation but insufficient competence.” Such findings are consistent with recent research on AI literacy, which indicates that learners often exhibit strong interest in AI while lacking adequate understanding and practical application skills (Ng et al., 2023). Furthermore, the results showed a statistically significant but weak positive correlation between AI learning attitudes and AI literacy ($r = .184$, $p < .05$). This finding aligns with the Technology Acceptance Model (TAM), which suggests that individuals’ attitudes toward technology influence their usage intentions but may have limited direct impact on actual competence. In other words, although positive attitudes serve as an important motivational foundation, their translation into practical skills remains constrained. In addition, the development of AI literacy involves multiple dimensions, including conceptual understanding, application skills, and critical thinking abilities (Long & Magerko, 2020). Therefore, motivation alone is insufficient to facilitate competence development. Structured instructional design and hands-on learning experiences are essential for supporting skill acquisition. Without opportunities for practical engagement, learners’ positive attitudes may not effectively translate into tangible competencies.

CONCLUSION

This study examined AI learning attitudes and AI literacy among community adult learners, with a particular focus on their social implications in the context of digital transformation. The findings revealed that although participants demonstrated generally positive attitudes toward AI learning, their levels of AI literacy remained comparatively limited. This pattern highlights a persistent gap between motivation and competence, suggesting that favorable attitudes alone are insufficient to ensure meaningful skill development. From a social perspective, this motivation–competence gap has important implications for digital inclusion and equity. In the era of rapid digital transformation, insufficient AI literacy may exacerbate existing forms of digital inequality, particularly among adult and community-based learners who may have limited access to structured learning opportunities. As AI technologies become increasingly embedded in everyday life, disparities in AI-related competencies could translate into unequal access to information, services, and participation in digital society. Furthermore, the weak association between AI learning attitudes and AI literacy suggests that individual motivation must be supported by broader structural and educational interventions. Without adequate access to learning resources, guided instruction, and experiential learning environments, positive attitudes may not effectively translate into practical competencies. This underscores the need for community-based educational strategies that prioritize not only awareness and motivation, but also skill development and applied learning. In light of these findings, future efforts should focus on developing inclusive and competency-based AI education programs that address the needs of diverse adult learners. Such initiatives are essential for promoting digital empowerment, enhancing social participation, and reducing inequalities in the context of digital transformation. Ultimately, strengthening AI literacy at the community level is not only an educational goal, but also a critical component of building equitable and resilient digital societies.

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