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Adult Learners' Self-Efficacy and Motivation When Using AI-Supported Learning Tools

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ABSTRACT

Learning technologies powered by artificial intelligence (AI) are swiftly transforming the world of adult education due to their adaptive feedback, customized paths of content and ongoing, on-demand assistance. Although it is often touted that such tools are universally helpful, the experience of adult learners with AI depends on specific psychological and contextual determinants, especially on the self-efficacy and motivation. The paper investigates the impact of AI-based learning tools on the beliefs of adult learners in terms of their perceived capacity to complete the task of learning as well as whether they can maintain their engagement in the process. The conversation is based on the recent findings, which put the emphasis on the importance of personalization, digital literacy, and user perceptions of the utility and trustworthiness of AI. The research paper points out that AI-based learning technologies can enhance self-efficacy among the adult learners, allowing the achievement of mastery experiences through instant feedback, scaffolding of complex tasks, and enhancing the online learning confidence of the learners. Expectancy-value beliefs that reinforce the expectation of persistence are promoted by motivation that improves when adult learners feel that AI can be useful, goal-oriented and relevant in relation to the real world. Nevertheless, as well as barriers to the efficiency of AI tools, unequal access, low digital literacy, and the digital divide are distinguished in this paper and may result in frustration and disengagement. The notion of explainability also becomes a critical aspect since AI tools might not be accepted or trusted by adult learners in cases when the decision of the system is not clear. The paper sums up by finding that AI-assisted learning technology would be capable of having a meaningful positive effect on self-efficacy and motivation in adult education, provided by equitable access policies, open system design, and instructional strategies that promote the growth of autonomous competence, as opposed to over-dependency. These results indicate that psychological preparedness and digital inclusion are critical aspects of AI integration which adult learning programs should consider in order to deliver sustainable learning results.

Keywords: *Adult learners, self-efficacy, motivation, AI-supported learning tools, personalized learning, digital literacy, digital divide*

INTRODUCTION

Adult education is on the rise in all parts of the world as people go back to schools to better their career opportunities, gain professional qualifications and cope with the fast world of employment. Compared to other students who are conventionally educated, adult students are often exposed

to various responsibilities which include work, parenting, financial limitations and time management; hence efficiency and relevancy are key expectations of the education program. Technology-supported learning has stood as a significant pathway of sustaining flexibility and access with such pressures. AI-assisted learning tools have more recently been integrated into the systems of adult education via intelligent tutoring applications, adaptive learning platforms, automated feedback systems and generative AI-based learning assistants. These tools are expected to offer customized learning journeys, instant response, and increased sensitivity to individual educational requirements. Nevertheless, AI systems do not have the same response with adult learners, and the success of AI-assisted learning is based on whether the tools enhance self-efficacy and motivation of learners.

Self-efficacy is the ability of a person to believe in his ability to accomplish something successfully, persevere through adversity and reach the learning outcomes. Motivation is a psychological force and an orientation to participating in learning and pursuing it persistently and effortlessly. Self-efficacy and motivation in adult learning situations have particularly significant implications since, in adult learning, individuals can resume studies after a long period of absence, negative educational experiences, or lack of exposure to technology. In case adult learners believe that they cannot achieve success in technology-mediated learning, they can pull out too soon and regard the learning environment as irrelevant to their needs. On the other hand, adult learning occurs when the adult learner is convinced that he/she can achieve success and the learning process is worthwhile then the adult learner becomes more engaged and will tend to persist.

This research paper discusses the self-efficacy and motivation of adult learners in terms of using AI-based learning tools, the mechanisms that facilitate positive learning beliefs, the obstacles that interfere with adopting the tools, and the equity conditions that can be provided to see the benefits disseminated widely. The paper aims to discuss the effects of AI personalization in promoting expectancy and value beliefs among adult learners, the impact that AI-based tutoring has on mastery and learning outcomes, the influence that explainability and technology acceptance have on motivation and engagement, and how the digital divide or varying degrees of AI competence impact the experience of adult learners. Attempting to fulfill these goals, the paper posits that AI-based learning systems can become potent facilitators of adult learning achievement, but only when the implementation is transparent, equity-centered, and aimed at enhancing the ability of individual learners to act competently on their own.

LITERATURE REVIEW

The perceptions of usefulness, trust and learning value also contribute to the use of AI tools by adult learners to a large extent. The literature analyzing the views of adult learners on AI-based learning technologies underlines the idea that adult learners do not hesitate to use educational technologies in a pragmatic way and evaluate whether they add value to the development and their skills (Ritter, 2025, December). This is an indication that AI does not necessarily improve the learning process just because it is there; it has to do with the perception of adult learners in relation to the perceived relevance and reliability of the tool. Notably, the perception of adult learners is directly related to self-efficacy since the confidence increases with the experience of learning tools as helpful, comprehensible, and goal-oriented. One of the reasons why AI has become the center of focus in adult education is personalization. Conceptualizing the role of AI-enabled personalized learning in the expectancy-value theory, Lyu and Salam (2025) suggest that when the learning environment supports the presence of expectancy of success and

perceived value of the learning outcomes, AI can indeed increase the self-efficacy, motivation, and digital literacy of adult learners. The expectancy-value theory describes motivation in terms of how much the learners think that they can achieve success and how much they think that the task is worth doing. Perceived value dimension is especially high in the adult education process since adult learners do not always have a lot of time and demand a direct correlation with work or life consequences. Thus, motivation and persistence can be enhanced with the help of AI tools with specific teaching, adaptive challenging, and contextually-sensitive learning activities.

A significant type of AI-based learning systems is AI-powered tutoring. There is evidence to suggest that such systems can help improve learning outcomes through the structured support, immediate corrective feedback, and adaptive learning progression (Basri, 2024). In the case of adult learners, these systems may help them overcome their uncertainty and also offer more chances to practice more often without the social pressure that may follow classroom engagement. The enhanced learning results will probably entrench self-efficacy due to the ability of adults to see tangible progress and explain the improvement through elevated competence, but not by chance. Nevertheless, AI tools should also be considered in terms of their effect on autonomy. Adult learners tend to be self-directed and are inclined to learning systems which respect their independence and personal agency. The field of AI-supported learning is becoming more associated with self-directed frameworks of learning where the researcher is urged to take control of his learning objectives and trajectories. A systematic review of the literature of self-directed learning with AI indicates that AI may aid in planning, monitoring and adaptive decisions in learning, and as such, may assist adult learners in maintaining engagement and developing confidence (Navas Bonilla et al., 2025). However, the same tools might also diminish agency when learners develop excessive reliance on AI-created instructions, which suggests that assistance should be designed in such a way that it encourages the development of competence instead of substituting self-control.

A major problem affecting AI experiences of adult learners is the digital divide. Issues related to access, such as a lack of access to internet connectivity, device access, a lack of digital literacy, and learning support access inequity are also present. According to the theoretical views of access and equity in adult education, technological advancements do not necessarily lead to equal results and may contribute to the increase in the inequality of results in case of unequal access (Ritter, 2025, January). In cases where the adult learner is not able to use AI tools reliably, or in cases that they do not trust in navigating the digital space, the motivation can be low and self-efficacy might become weak following the occurrence of repetitive barriers and irritation.

This topic is also informed by the relationship that exists between online learning performance and self-efficacy. Tang et al. (2022) indicate that information-seeking self-efficacy and online learning self-efficacy affect the proficiency in performance of learners, suggesting that the confidence of the learners in seeking information and coping with online activities has a strong relationship with learning performance. This view applies to adult learners who use AI tools since most of the AI systems serve as information assistants that affect the way learners search, interpret and use information. The motivation and performance can be enhanced when AI creates integrity and trust in information search and diminishes perplexity during automated education. Another dimension is technology acceptance. Explainability has the power to either build trust or not in users regarding AI systems and render them as fair, reliable, and understandable. One of the frameworks

that relates AI explainability to the technology acceptance model is that open AI decision-making leads to higher acceptance and may enhance learning engagement in a learning setting (Panagoulias et al., 2024). It is especially adult learners who can lose interest when AI feedback appears to lack consistency or cannot be explained in a clear manner. Explainable AI will increase the likelihood that learners will trust the guidance provided by AI and use feedback to help them plan their learning. AI competence and generative AI application are increasingly being relevant to adult learning. A scale of generative AI as lifelong learning self-efficacy shows that the confidence of learners in the use of AI tools is also a significant dimension of competence (Arslankara and Usta, 2024). This implies that adult learners might need specific guidance to be trained to acquire not only content knowledge but also the valuable and critical use of AI tools so that the use of AI becomes more robust than the lack of independence.

MATERIALS & METHODS

This research adopts the secondary research design, which includes qualitative synthesis of the current peer-reviewed literature covering the AI-supported learning tools, the adult learner, self-efficacy, motivation, digital literacy and technology acceptance. Methodological approach entails the conceptual synthesis of theoretical and empirical data of the chosen sources in order to define a consistent analysis of mechanisms and barriers. The main constructs, which will be assessed, are the impressions of adult learners of AI tools, the expectancy-value processes involved in motivation, self-efficacy building with the help of feedback and results, and equity restrictions regarding accessibility and digital divide issues. The process included determining the patterns in the literature and classifying them as the central areas that are related to adult learning and AI-mediated studies and synthesizing the results into an argumentative narrative. The domains are perceived usefulness and trust of AI tools, customization and adaptive tutoring support, enhancing self-directed learning, explainability and user acceptance, limiting the digital divide, and the role AI competence plays in lifelong learning. The article assigns these areas to the analysis of the impact AI tools have on the psychological preparedness and persistence of adult learners.

RESULT

The findings of this literature-based synthesis suggest that AI-based learning devices affect the self-efficacy and motivation of adult learners by four prevailing mechanisms, including the personalization, which reinforced expectancy-value beliefs, the feedback and tutoring systems, which supported the mastery experiences, the self-directed learning supports, which facilitated the self-directed learning, and the trust-building features that conditioned the technology acceptance. Motivation of adult learners grows when AI tools allow to match the learning tasks to the desired results and offer learning tasks as possible to accomplish by means of systematic guidance. It has been shown that AI customization may lead to enhanced perceived relevance of learning activities and enhanced expectancy beliefs related to success, particularly when systems are personalized to the pace of learning and they are responsive (Lyu and Salam, 2025). Moreover, AI tutoring systems seem to enhance learning achievement, and these gains are accompanied by increased confidence and longer engagement (Basri, 2024). The effects of self-efficacy are the most evident when AI instruments offer scaffolding that facilitates the gradual acquisition of skills instead of generating answers without the participation of learners. The perceptions of AI usefulness and trustworthiness among adult learners have a strong mediation effect on these outcomes and indicate that psychological

benefits may be associated with favorable user interpretation (Ritter, 2025, December). AI tools can be explained and transparent in their feedback mechanisms, which enhances trust and leads to technology acceptance, and minimizes uncertainty (Panagoulias et al., 2024).

The findings also indicate that the barriers are still important. Such factors as digital divide, such as the unequal access and the level of digital literacy, decrease the motivation and self-efficacy by making frustration more probable and constrained the regular use of the tools (Ritter, 2025, January). Moreover, the self-efficacy of online learning and the commitment to information seeking of learners are the factors that will affect performance and probably define the effectiveness of adult learners using AI-assisted systems (Tang et al., 2022). Lastly, the ability to use generative AI becomes a distinct field of self-efficacy, in which the benefits of adult learners might be achieved only when they are taught how to use AI itself (Arslankara and Usta, 2024).

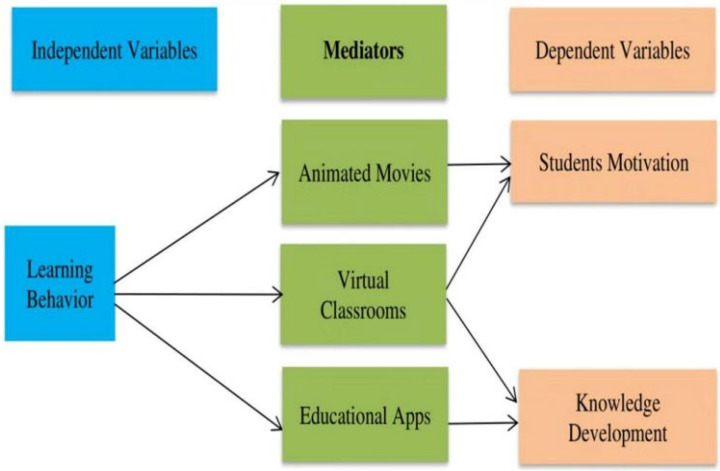

Figure 1: Conceptual Model of AI-Supported Learning Tools and Adult Learner Outcomes (Self-Efficacy and Motivation)

Conceptual model of the relationship between learning behavior, digital learning platforms, student motivation, and knowledge development. *Adapted from* Noor et al. (2022).

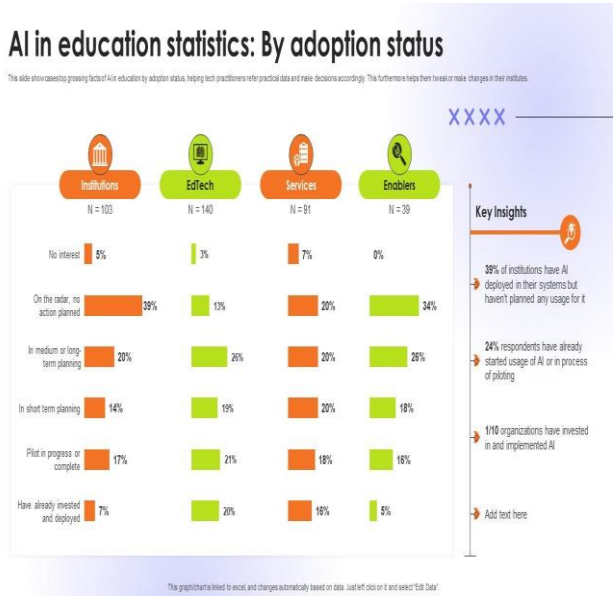

Figure 2: AI Adoption in Adult Education as Influenced by Explainability, Digital Divide, and User Acceptance

Figure 2. *AI in education statistics: By adoption status* showing levels of AI adoption readiness across institutions, edtech, services, and enablers, including categories such as no interest, planning stages, pilot implementation, and fully deployed AI use. *Adapted from* SlideGeeks (n.d.).

DISCUSSION

Discuss The results of the current research help to hold to the conclusion that AI-based learning tools can reinforce the sense of self-efficacy and motivation in adult learners, yet the advantages of these tools hinge on the ability to produce meaningful mastery experience, support the values beliefs, and decrease obstacles that impair confidence. Autonomous learning environments are often needed by adult learners who need efficient, relevant, and supportive learning environments. The AI tools are promising in all these three aspects though they should be deployed cautiously in order not to widen the gap or result in diminished learner agency.

An expectancy-value mechanism is also among the reasons that can be cited as the strongest motivational driving force that makes personalized AI support a more effective reason why persistence should be enhanced. In case AI devices adjust the learning tasks to the current level of competence and offer adult learners some steps that can be attained, learners are more predisposed to anticipating success and continuing to work (Lyu and Salam, 2025). The motivation is not only increased because it will be easier but also increased because the tasks will be more strategically manageable. Learning which appears possible is extremely encouraging in the case of adult learners that usually have time limitations. The perceived usefulness of AI tools is also significant since adult learners usually seek relevance at the moment. AI systems that are used to explain the purpose, indicate progress and relate learning to real life results can solidify value beliefs resulting in higher engagement. The quality of feedback and improvement of performance is particularly crucial in adult learning situations that require self-efficacy development. Self-efficacy can be enhanced with AI-generated tutoring systems that offer instant feedback and adaptive training to allow adult learners to feel a sense of mastery more often (Basri, 2024). Nevertheless, the self-efficacy benefits of adult learners will be less powerful in the case when AI instruments substitute cognitive effort instead of promoting it. When AI tools provide complete solutions and the learners do not need to practice reasoning, they will become dependent, as opposed to competent. This is the reason why the integration of AI should be preoccupied with scaffold that promotes the development of the learners and the creation of strategies.

The important mediators of the AI learning experience are perception and trust. The perceptions of the adult learners towards the AI-based learning tools are indirectly related to their general views regarding whether AI can help them learn in a meaningful way or whether it distracts them from their actual competence building (Ritter, 2025, December). When the adult learners perceive the AI as supportive and goal-oriented, motivation increases. When they perceive AI as disorienting or uncertain, they become demotivated. Reliability is enhanced by transparency and clarification. Explainability is neither a technical nor luxury need but an educational requirement since in many cases adult learners must understand the feedback and have reasons to use it in order to be sure to implement it. Theories that relate AI explainability with technology acceptance highlight that the interpretability of AI decisions can elevate acceptance and protect more stable interaction (Panagoulias et al., 2024). Adult learners who embrace and believe in the role of AI tools have a high probability of remaining and perceiving learning difficulties as attainable.

The other mechanism by which AI can contribute to improved adult learning is

through self-directed learning support. Adult learners often study in autonomous or distance mode where individual organization and self-control is what leads to achievement. Self-directed learning may be assisted with the help of AI tools that provide reminders, progress monitoring, adaptive suggestions, and individualized pacing (Navas Bonilla et al., 2025). Such supports are capable of making the learner more motivated because they have less uncertainty and a sense of control in their learning process is enhanced. Nevertheless, it is still necessary to make sure that AI does not compromise autonomy by subjecting learning preferences to unnecessary influence or prompting passive dependency. The AI should be part of an adult learning environment as a coach that supports self-management within a learner and not a coach that eliminates the need to make decisions. Equity factors have a great influence on the ability of AI-supported tools to promote or diminish the motivation and confidence of adult learners. The digital divide is an influential obstacle in adult education, and unequal access is what nullifies the flexibility that AI tools are supposed to offer (Ritter, 2025, January). Those adults who have less access to devices, less regular internet, or limited digital literacy are the less likely beneficiaries and are likely to face frequent disruptions that decrease self-efficacy. In case the learners encounter technological obstacles, the problem can be perceived as their own fault and reduce the anticipation of success and withdrawal motivation. As such, it must be implemented fairly, such as training, technical assistance and malleable access frameworks that lessen the tension on the learners.

The importance of the online learning self-efficacy and information-seeking confidence also serves to explain why adult learners can be responsive to AI tools differently. Learners who believe that they will be able to navigate online environments and lead to the search of information are more likely to perform well and stay engaged (Tang et al., 2022). Self-efficacy and motivation can be reinforced with the help of AI tools which optimize these beliefs. However excessive reliance can undermine the confidence in information seeking when learners are no longer trained in independent search and assessment abilities. In the case of adult learners who tend to require competence in the workplace in terms of critical thinking, the objective should be AI-assisted competence, but not AI-dependent performance. AI competence itself becomes one of the types of self-efficacy and is found to be important to lifelong learning. The confidence of adult learners in their ability not only to know the subject but also to use AI tools in a proper and responsible way is becoming a growing need. The fact that the concept of generative AI competence is quantified as a lifetime learning self-efficacy reinforces the hypothesis that adult learners gain advantages when the concept of AI integration encompasses the development of skills in using, evaluating, and applying AI in an ethical manner (Arslankara and Usta, 2024). As long as adult learners know how to use AI tools tactically, chances are that the level of motivation will also be high since they will tend to feel that they can learn in contemporary digital settings.

CONCLUSION

The findings of this paper have concluded that AI-based learning tools can be used effectively to improve the self-efficacy and motivation of adult learners when they are used in a manner that reinforces mastery experiences, trains expectancy-value beliefs, fosters self-directed learning, and enhances user trust through explainability. AI tools are most effective with adult learners when they are scaffolded to foster independent competence as opposed to substituting cognitive work. Adult learners will be eager to use AI tools when they see them as helpful, applicable, and relevant to their real-world expectations. The digital gap is one of the primary limitations that may undermine motivation and decreases self-

efficacy in the conditions of low access and low digital literacy. Consequently, implementation, training assistance, and clear system design are necessary to provide fair use of the AI tools as empowerment tools in adult learning. learning with the help of AI in the adult educational process must be regarded as a psychological and equity-sensitive innovation, but not as a technological upgrade, since the confidence and persistence of adult learners will define whether AI becomes a sustainable source of educational value

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