

Adult Learners' Perceptions of AI-Supported Learning Tools: A Secondary Data Analysis of Recent Literature

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ABSTRACT

Artificial Intelligence (AI)-supported tools designed for learning are highly integrated into adult learning programs. Nonetheless, research on adult learners' perspectives, particularly regarding self-efficacy, motivation, ethical issues, and usefulness, remains scarce and limited. This study conducts a secondary data analysis of 12 current peer-reviewed articles published between 2018 and 2025. A simple qualitative research framework is employed to categorise common themes reported across the selected studies. The articles are reviewed and categorized into key themes, including motivation and engagement, perceived efficiency, personalisation, and ethical concerns. The findings show that approximately 83 percent of the studies reported positive adult learners' perspectives of AI-supported tools, and 75 percent indicated increased engagement or motivation. Improvement in the effectiveness of learning was reported at 60 percent. Nonetheless, about 58 percent identified issues linked to algorithmic bias and transparency. Additionally, 50 percent highlighted the need for greater involvement of the tutor. Overall, the results indicate mixed yet generally positive perceptions among adult learners toward AI-supported tools, aligning with existing research. Thus, this study addresses a knowledge gap by

examining adult learners' perceptions of AI-supported learning tools, underscoring the importance of adopting these tools alongside ethical safeguards, individual support, and clear communication.

Keywords: Artificial Intelligence, Adult Education, AI Perceptions, Secondary Data Analysis, Motivation, Ethics

INTRODUCTION

Adult education undergoes significant changes with the integration of digital tools within the learning environments, especially the use of AI-supported systems and LLM models [3, 7]. Notably, the AI-supported tools incorporate adaptive learning platforms, algorithmic recommendation tools, analytics dashboards and automated feedback systems [12, 13]. The utilisation of these tools within the higher education fields, professional training, community-based adult education and workplace learning continues to expand [6, 14]. As noted by Holmes, Bialik, and Fadel, adult learners differ significantly from young adults and children in their motivations, prior knowledge, goals, and time constraints. Accordingly, adult learning theory associates these differences with self-direction, relevance to real-world tasks, and purposeful learning [3]. These concepts suggest that AI tools are likely to offer key advantages for adults, including timely feedback, enhanced accessibility, flexible pacing, and

personalized goals.^[12] However, other studies suggest potential risks such as lack of transparency, unequal digital access^[14] and concerns on privacy^[4,14] as well as reliance on algorithms^[5,8]. The study by Moch and Ritter, provides a valuable standing point on the link between AI and adult learning, particularly noting how personalized AI systems enhance learning outcomes. However, key concerns arise on whether institutions are ready to adopt the systems, with the rising conceptual clarity within learning theories^[1]. Besides, within the creative and professional disciplines, there is the need for core awareness, tech ethics, and AI literacy among adult learners^[2].

Despite the rapid increase in research on adult learning, analysis of adult learners' outcomes remains limited and scarce, creating a significant knowledge gap. Examining learners' attitudes, perceptions, and experiences is essential for promoting an effective AI-supported learning environment. This study addresses this gap by reviewing existing studies and presenting relevant outcomes through a simple qualitative analysis.

Research Objectives

1. To identify perspectives of adult learners towards AI-supported learning tools and programs.
2. To categorize adult learners' perspectives through qualitative research methods of the data obtained from the secondary sources.
3. To examine the implications for adult education frameworks and practice.

MATERIALS AND METHODS

The research utilized a secondary data analysis mechanism, drawing exclusively from already-existing peer-reviewed studies instead of primary data collection. Notably, secondary analysis is key for examining the trends across various research, enabling the establishment of recurring trends and themes without carrying out new field research.

Study Selection

The study involved selecting about 12 articles published between 2018 and 2025. This category included International Journals of Research Review articles^[1-2], policy reports, books and peer-reviewed journal articles^[3-14]. The criteria for inclusion included examining learners age 18 years and above. Also, the studies needed to be in English and incorporate AI-supported learning frameworks. Besides, they had to report on the perceptions, satisfaction and attitudes of the learner. Finally, they had to be peer-reviewed and published between 2018 and 2025, with extractible data relevant to the perception of the adult learners towards AI-supported frameworks.

Excluded research included those that emphasised exclusively on children, non-peer reviewed publications like reviews and blogs as well as sources that lack perception-linked data.

Statistical Methods

The study employed qualitative data analysis methods from the secondary data sources that were selected for analysis. For the study, data was obtained based on the size of the sample, educational context like workplace, creative fields and higher education, and demographics of the learners. Furthermore, that data was linked to the category of the AI tool, and the presented perceptions^[1-14]. The outcome was categorized into five key themes including:

1. Personalisation
2. Ethical concerns
3. Challenges and limitations
4. Engagement and motivation
5. Perceived effectiveness.

The research involved coding data for the absence or presence of these categories. No inferential statistic was carried out, consistent with the objective of examining literature instead of testing new hypotheses.

RESULTS

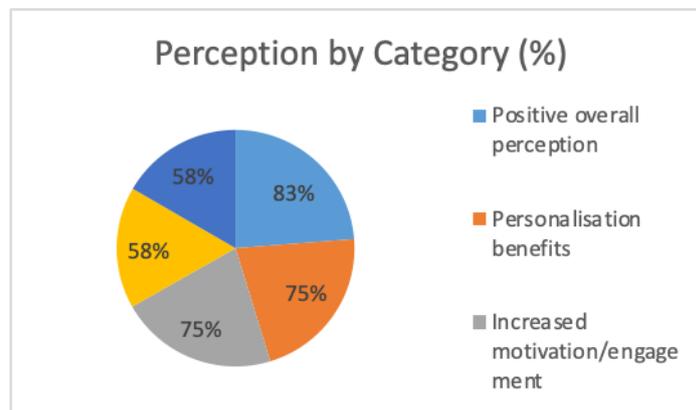
The study included 12 studies. The studies selected in the evaluation covered diverse contexts of adult learning. These included

higher education [12], mixed and general education environments [3,14], creative or digital fields [2,6], and professional training programs [6,7]. Within the context of AI tools, the range included intelligent tutoring systems to adaptive learning systems and analytics dashboards as well as AI-based creative frameworks [1,2,12]. From the selected 12 studies, about 2,430 of adult

learners were represented. The participants ranged from the age of 18-64. From the studies, the methods incorporated four qualitative [1,2,6], two quantitative [12,13] and three that incorporated mixed mechanisms [3,7,14].

Summary of Findings

| Perception Category | Number of Studies | Percentage |
|---------------------------------|-------------------|------------|
| Positive overall perception | 10 | 83% |
| Personalisation benefits | 9 | 75% |
| Increased motivation/engagement | 9 | 75% |
| Challenges/barriers | 7 | 58% |
| Ethical concerns | 7 | 58% |



Positive Perceptions of AI Tools

About 10 of the selected 12 research indicated significantly positive learner perspective of AI-supported learning frameworks [1,2,3,6,12]. To explain more, the results of the qualitative meta-analysis of Ritter shows that adult learners obtain key outcomes on average within intelligent tutorial settings compared to traditional mechanisms. The results also show that international comparative research like that of OECD PISA shows measurable variations in performance linked to digital learning frameworks with AI elements. The study calls for accountability, transparency and structural inertia. It points to the fact that AI can modernize learning outcomes when frameworks are personalized thus, enhancing the learning processes. Furthermore, potentials are seen when ethical standards and institutional aspects are in place and reforms are allowed [2]. Similarly, findings

imply that while ITSs has the potential of enhancing learning test scores and attitudes, the impacts on problem-solving skills, performance, knowledge gain and motivation remain less conclusive. The outcome on education outcomes differ across various nations and educational categories, with limited key relations among educational categories and effectiveness [12]. Further results show that effectiveness increases with the incorporation of AI-based tools. Positive perceptions were established on the impacts of intelligent tutoring framework, compared to human tutoring. In addition, one of the studies showed increased confidence and motivation when interacting with AI-based tools [1]. The study also showed that AI can limit cognitive load thus, allowing adult learners to emphasise on high-priority roles.

Personalisation

This category emerges as a sound theme in nine different research, accounting for about 75 percent of the studies reviewed. Accordingly, adult learners appreciated the potential of the AI tools to specialize content as well as pathways based on the person's progress, preferences and knowledge. Various elements like personalized content suggestions, custom pacing as well as real-time comment were illustrated as being significant, time-efficient and stress-reducing [2,12]. The IJRR creative-media research stressed that AI system personalisation also promotes creative autonomy [2], allowing innovation and experimentation among the learning adults with limited fear of being judged.

Motivation and Engagement

Various studies showed positive outcomes based on engagement and motivation [1,2,3,6]. To explain more, the results of most of the studies showed that adult learners showed significant willingness towards completing tasks, increasing their confidence while utilizing the AI tools not to mention their potential. The further showed key outcomes in the sense of being supported by the AI tools. Other studies illustrated increased willingness to experiment and creativity, especially within media-linked learning settings [2,6].

Challenges and Barriers

Regardless of the positive perceptions, about 58 percent of the research illustrated limitations, which constrained adult learners' experiences with the AI-based tools [4-6]. Some of the identified problems incorporated technical challenges, AI role's confusion, the preferences for the human tutor guide and lack of proper digital proficiencies. The limitations were further linked to limit instructional scaffolding, institutional readiness, alongside uneven access to tech and digital tools. The outcomes from these studies indicate that AI tools are effective, however, they should not be operated in isolation. Instead, they have to be used

together with informed tutors who have the capability of contextualizing the tech for the adult learners [6,14].

Ethical Concerns

Seven of the 12 studies highlighted the effect of ethical considerations, indicating a proportion of about 58 percent of the studies identified [4,5,8,10]. The ethical issues that featured in most of the studies incorporated lack of transparency in the algorithm, issues with the aspect of data privacy alongside the potential for biased AI suggestions. Most of the adult learners showed increased interest in frameworks, which enabled them to acknowledge the way AI formulates decisions and obtain individual oversight for analysis. It also incorporated the way AI-generated comments when required. Two studies including that of Moch, Ritter and Ritter underscores the significance of including AI literacy and digital ethics within adult learning programs. The evaluation established indicates that ethical issues are relevant aspects that affect the perceptions of adult learners.

DISCUSSION

The results section offers comprehensive and core illustrations of the adult learners' perspectives towards AI-supported learning tools. The results of the study show a positive response towards AI-generated tools and technology. In this case, the adult learners value immediate feedback, flexibility, and personalisation that come with the tools. The study's outcome aligned with adult learning policies, such as the need for practical applications, goal orientation, and self-direction as well as relevance in adult learning programs. Different adults highly engage with the AI-supported tools, which adapt to their specific learning processes, offering timely and key feedback thus, promoting autonomous decision-making processes.

Positive Perception and Motivation

The evaluation established that about 83-percent of the studies reported overall

positive adult learners' perspective. The results underscore the capabilities of AI-based tools towards enhancing experience for the individuals. The learners often stated improvements in comprehension, effectiveness and clarity as the primary advantages. The outcome aligns with previous studies in adult research that consistently connect interactive and personalized AI-based learning tools to their satisfaction and engagement. The study by Moch and Ritter, "Intelligent Systems, Individual Minds" ^[1] showed that the perception of the adult learners towards AI-supported systems includes increased self-efficacy and motivation. Most of the participants cited increased confidence in their completion of tasks as well as mastering hard concepts. Within creative and professional contexts, the AI-based tools showed positive outcomes towards promoting experimentation and innovation, showing the appreciation of autonomy among the adult learners, not to mention [promoting chances towards increasing their problem-solving potentials.

Personalisation as a Primary Benefit

In the study, personalisation was highly stressed as a core advantage, appearing in about 75-percent of the studies obtained for review. The results showed that adult learners valued the AI-based tools, which sequence content, offer core feedback and adjust pacing based on previous levels of skills and knowledge. The distinct learning mechanisms allowed the adult learners to stress on aspects that need development while bypassing mastered or repeated content. The results align with the principle of andragogy by Knowles, which emphasises that adult learners' value learning that is specific to their needs, practical and relevant. The creative media research further showed that personalisation supports creative autonomy ^[2], enabling the individuals to experiment in media and design tasks with real-time guidance on the use of AI systems. The tools not only promote the learners' engagements but also enhance their

confidence, particularly in various learning settings that support their demands.

Motivation, Engagement, and Learner Confidence

The AI-generated learning systems were also cited to enhance motivation and engagement in about 75-percent of the research. The individuals often illustrated being confident and supported, not to mention persistent in the assigned roles. The outcomes are core due to the fact that motivation is a significant predictor of learning success and persistence in adult education. The potential of the AI-supported tools to offer immediate comments as well as adjust challenging levels contributes to self-efficacy and achievement. This aligns with Bandura's social cognitive theory that focuses on mastery encounters as core to the development of confidence ^[12]. Within professional and creative contexts, AI-supported tools promote exploratory learning, allowing the adult learners to task various risks and enhance significant solutions without immediate failure or fear of failing.

Challenges and Limitations

Regardless of the positive perceptions outlined in the analysis, approximately 58-percent of the research established ^[4-6,14]. Confusion related to the AI-supported role, reduced digital literacy and tech challenges were established as highly popular ^[14]. Most of the adult learners showed preference for individual tutors with the aim of complementing the AI-supported tools, stressing on the irreplaceable role played by emotional guidance, contextual acknowledgment and pedagogy. The findings align with this research implying that AI tools work best as augmentative instead of replacement techs. With limited scaffolding, the adult learners are likely to face increased anxiety, disengagement and frustration, especially in settings in which digital resources and support are scarce. Meeting these limitations need investments in infrastructure, learners support

frameworks, and tutor training towards maximizing AI-supported advantages [7,12].

Transparency and Ethical Concerns

Ethical concerns featured in about 58-percent of the studies that were examined. Most of the studies outlined concerns about data privacy, bias and transparency of the algorithms [4,5,8,10]. The adult learners showed increased need for clarity relating to the way AI-supported tools generate feedback in addition to the processes for dispute resolution and oversight. The findings underscore the significance of integrating AI literacy in adult education programs [1,2,5]. Other studies reinforce that AI literacy remains a tech skill. In addition, it is a core aspect in increased engagement with the AI-generated learning programs [1,2]. The results emphasise UNESCO [10] and OECD [9] suggestions on responsible utilisation of the AI-supported tools in learning processes. Allowing tutors to educate on the relevance of examining AI-supported outputs, acknowledge key algorithmic biases and the implications of data privacy can limit ethical issues while promoting autonomy among the learners.

Human Support and Tutor Integration

About half of the selected research reported the current need for the involvement of a human tutor. Two of the studies supported the need for AI-supported tools to act as augmentative frameworks instead of replacement techs [12,13]. Even though the AI-supported tools provide core advantages in engagement and customisation, adult learners continue to show increased appreciation for pedagogical judgment, context-distinct comments and emotional support, which AI cannot yet replace. The results have significant implications for instructional designs. To explain, AI-supported tools have to be implemented as a complement to the skilled individual tutors, who have the potential of offering scaffolding, provide guidance and address primary acknowledgements. Comprehensive integration needs proper

training of the tutors to integrate the AI-supported data, promote ethical standards and adjust learning mechanisms within the adult learning settings [3,7].

Implications for Adult Education Practice

The findings of this research incorporate various practical implications. Accordingly, AI-supported learning tools have to feature clear and precise explanations in their operations, constraints and decision-making mechanisms. Transparency reduces anxiety, promoting trust among adult learners who are less knowledgeable about the algorithmic systems. Besides, various learning institutions need to focus on including digital equity with the aim of guaranteeing access to AI-supported tools. This mechanism helps limit the marginalisation of individuals with limited access to digital resources. Also, professional development programs need to offer the right expertise in integrating AI within the learning programs comprehensively. The reason is that it leverages data insights while increasing individual oversights. AI literacy should be incorporated in these programs to promote reasoning, problem solving skills and ethical digital awareness.

Integration with Broader Literature

The results established align with the increasing body of research on digital literacy and AI in education. Studies focusing on creative fields, higher learning and professional training converge on the idea that AI tools promote positive outcomes when they remain engaging, tailored to distinct needs, and ethically managed. Nonetheless, consistent with UNESCO and OECD guides, the importance of AI relies on its integration within the system and individual support, not to mention practical issues, ethical concerns and the institution's readiness to adopt them. This study supports that adult learners' ideologies are multifaceted, illustrating both caution to privacy, individual needs and transparency as well as being enthusiastic for the potentials of AI-supported tools.

Future Directions

Further analysis should examine longitudinal effects of AI-supported systems on adult learners' learning results, self-efficacy and motivation. Descriptive and longitudinal studies examining variations across creative, profession and higher education contexts could provide further insights into domain-distinct adult learning needs. In addition, analysis could emphasise on exploring how AI literacy affects adult learners' perceptions and engagements, helping educators design curricula and programs that provide maximum benefits. The programs could also stress on ethical and technical concerns of these tools.

CONCLUSION

This study examined adult learners' perceptions of AI-supported learning tools, drawing from secondary data sources. The data was obtained from about 12 existing literatures. The analysis included identifying relevant themes via the qualitative analysis method. The results illustrate that adult learners perceive AI-supported learning tools positively. Some of the reasons included the flexibility of the tools, timely feedback, and customisation. Across the established 12 studies, adult learners indicated that AI supported tools enhanced their confidence, engagement, comprehension and foundations principles of adult learning like goal-oriented, relevance and autonomy. AI-support tools allowed adult learners to go through content at their pace thus, illuminating personalisation as a primary theme. The other major theme was immediate feedback, skills gap and prior knowledge of the tools. The AI-supported tools also increased self-efficacy, motivation and creative reasoning, especially within media-related and professional contexts. Despite these benefits, adult learners showed concerns over the ethical usage of the tools and issues linked to their transparencies. Potential bias, privacy of data and algorithmic opacity were some of the issues reported. As such, there was an increased need for ethical adherence and AI literacy.

Contemporary tutor support was also stressed by the learners because the AI tools were considered valuable in their oversight. However, AI-supported tools are not solutions to all problems, the results underscore the need for its integration with careful considerations of the pedagogy involved, institutional readiness and ethical governance. The implications include providing distinct illustration of the functionalities of the tools. The integration of AI literacy within the learning program offers the training instructors to use AI-supported tools effectively. By overcoming these limitations and challenges identified in the study, the curricula targeting adult learners can be customized to increase their learning experiences, engagement and satisfaction. From the study, AI-supported tools have core potentials for the users including the adult learners. Nonetheless, their success depends on context-distinct use and ethical considerations, leveraging the innovations involved and human support.

Declaration by Authors

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Lars Arnold Ritter is a university lecturer and is currently doing his doctorate at the University of Library Studies and Information Technologies (ULSIT) in Sofia. In his dissertation, entitled *Optimising the Organisation and Management of Information Processes for Increasing Motivation and Effectiveness of Adult Education*, he is developing his own Learning Management System (LMS), which is geared towards efficiency, motivation and sustainability in adult education. He teaches academic work at several universities and combines academic expertise with practical advice, l.ritter@unibit.bg

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