



TEACHER'S PERCEPTION TOWARDS ARTIFICIAL INTELLIGENCE IN EDUCATION

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Abstract:

This study investigated teachers' perceptions towards the integration of artificial intelligence (AI) in educational settings. A cross-sectional survey design was employed, collecting data from 285 teachers across secondary and higher education institutions using a structured questionnaire. The instrument measured AI awareness, perceived benefits, perceived challenges, and attitudes toward AI adoption. Data were analyzed using descriptive statistics, independent samples t-tests, and one-way ANOVA. The findings revealed that teachers demonstrated moderate levels of AI awareness, with a mean awareness score of 3.42 (SD = 0.87) on a 5-point scale. A majority of participants (68.4%) recognized the potential of AI to enhance personalized learning experiences. However, significant concerns were expressed regarding data privacy (72.3%), displacement of teaching roles (61.1%), and inadequate institutional support (58.9%). Teachers with prior AI training showed significantly more positive attitudes compared to those without such training ($t = 4.23$, $p < 0.001$). The study concludes that while teachers acknowledge the transformative potential of AI in education, targeted professional development programs and robust institutional frameworks are essential to address prevalent concerns and facilitate effective AI integration in pedagogical practices.

Keywords: Artificial intelligence, teacher perception, education technology, AI integration, pedagogical practices

IMPLICATIONS AND CONTRIBUTIONS

By examining teachers' perceptions in this study, it fills a gap in the literature on AI in education, an aspect that has been largely overlooked (1,2). The results have implications for educational policy makers, institutional leaders, and teacher training programs. This research can inform specific intervention development for targeted professional development opportunities, especially in relation to concerns identified, like data privacy and role displacement. Moreover, the study emphasizes the positive impact of previous training on teachers' attitudes toward AI, calling for structured capacity development programs. The findings also advance the theoretical framework by bringing the TAM into the realm of educational applications with AI, and into the gap between broader technology acceptance studies and AI-specific learning applications in education (3,4).

1. INTRODUCTION

Artificial Intelligence (AI) has proven to be one of the most game-changing technologies of the twenty-first century, revolutionizing our world in so many areas of society that it is hard to imagine what could be accomplished without it (1). In the field of education, AI is being applied in a range of ways, such as adaptive learning systems, natural language processing, and machine learning, in teaching and learning activities (2,3). These technologies offer the potential for individualized learning experiences, for automating routine assessment tasks, and for offering data to inform instructional decisions (4). The global AI in education market has experienced significant expansion as the world has come to understand its potential to tackle persistent problems with the delivery of education and accessibility (5).

The successful implementation of AI in education heavily relies on the attitudes and perceptions of the key actors in education: educators (6). Teachers' beliefs and concerns, as well as their predispositions toward innovations, are crucial for the successful implementation of AI-enhanced pedagogies in classrooms (7). Teacher perception has been shown to be a key factor in affecting technology adoption behavior, and negative perceptions can be inhibiting to effective integration (8,9). Therefore, comprehending teachers' perceptions of AI technologies becomes crucial for policy-making, curriculum development, and the implementation of AI in an authentic way to support learning objectives (10).

The surge in the number of applications of AI in the education sector has outstripped empirical studies on teachers' attitudes toward AI technologies (11). Although there have been reviews on the uses of AI in higher education, the perception of in-service teachers at different educational levels (12,13) has remained relatively under-researched. This divide is especially notable, as the insights gained from frontline educators' perceptions offer valuable context on the practical challenges and opportunities that arise with the use of AI that technology-based assessments may not reflect. The aim of this study was to delve into teachers' perceptions of AI in the context of education, focusing on their awareness, perceived benefits, perceived challenges, and attitudes toward integrating AI. What is the teachers' awareness of the applications of AI in education? What are teachers' perceptions of the benefits and challenges of integrating AI? What are the effects of demographics and earlier AI training on teachers' attitudes towards AI in education?

2. MATERIAL AND METHODS

Research design

A cross-sectional survey research design was adopted for this study. This approach was selected as it enables the collection of data from a large sample of participants at a single point in time, facilitating the identification of patterns and relationships among variables of interest (15). The study was conducted over a period of three months, from January to March 2024, across educational institutions in multiple regions.

Participants

A total of 285 teachers participated in this study, comprising 142 (49.8%) male and 143 (50.2%) female educators. Participants were drawn from secondary schools ($n = 158$, 55.4%) and higher education institutions ($n = 127$, 44.6%). The mean teaching experience of participants was 12.6 years ($SD = 7.3$), with a range of 1 to 35 years. Purposive sampling was employed to ensure representation across different subject areas, including STEM disciplines ($n = 121$, 42.5%), humanities and social sciences ($n = 108$, 37.9%), and vocational education ($n = 56$, 19.6%). The demographic distribution of participants is presented in Table 1.

Instrument

Data were collected using a structured questionnaire developed through a rigorous multi-step process. The initial item pool was generated based on a comprehensive review of existing literature on AI in education and technology acceptance frameworks (1,3,16). The questionnaire comprised four sections: AI awareness (8 items), perceived benefits (10 items), perceived challenges (10 items), and attitude toward AI integration (8 items). All items were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Content validity was established through expert review by a panel of five specialists in educational technology and research methodology. The instrument was pilot-tested with 30 teachers, and the results demonstrated satisfactory internal consistency, with Cronbach's alpha coefficients ranging from 0.81 to 0.89 across the four sections.

Table 1. Demographic characteristics of participants (N = 285)

Characteristic	n	Percentage (%)
Gender	—	—
Male	142	49.8
Female	143	50.2
Educational level	—	—
Secondary school	158	55.4
Higher education	127	44.6
Teaching experience (years)	—	—
1-5	62	21.8
6-15	128	44.9
>15	95	33.3
Subject area	—	—
STEM	121	42.5
Humanities/Social Sciences	108	37.9
Vocational education	56	19.6
Prior AI training	—	—
Yes	89	31.2
No	196	68.8

Note: STEM = Science, Technology, Engineering, and Mathematics. AI = Artificial Intelligence.

Ethical considerations

The study was approved by the Institutional Review Board (IRB). All participants provided written informed consent prior to their involvement in the study. Participants were informed about the purpose of the research, the voluntary nature of their participation, and their right to withdraw at any time without any consequences. All data were collected

anonymously and stored securely in compliance with applicable data protection regulations. No personally identifiable information was collected at any stage of the study.

3. Data analysis

Descriptive statistics including means, standard deviations, frequencies, and percentages were computed to summarize the data. Independent samples t-tests were conducted to examine differences in attitudes toward AI based on gender and prior AI training. One-way analysis of variance (ANOVA) was employed to assess differences across teaching experience groups and educational levels. All statistical analyses were performed using SPSS version 27.0, with the significance level set at $p < 0.05$.

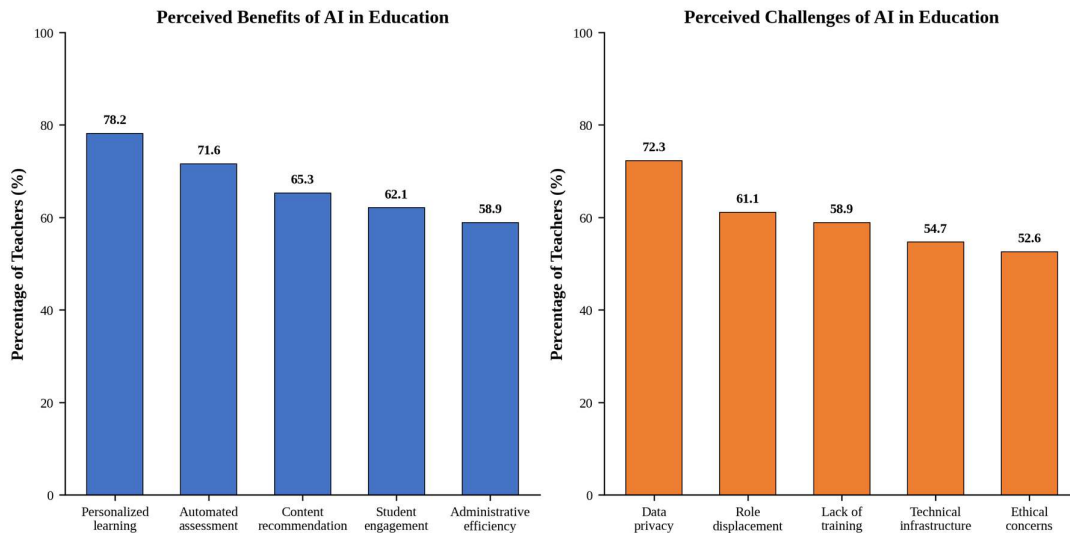


Figure 1. Perceived benefits and challenges of AI in education as reported by teachers (N = 285)

4. RESULTS AND DISCUSSION

AI awareness among teachers

The findings revealed that teachers demonstrated a moderate level of AI awareness, with a mean score of 3.42 (SD = 0.87) on the 5-point scale. This result is consistent with the observations of Zawacki-Richter et al. (12), who noted that while educators generally recognize the existence of AI technologies, their understanding of specific applications in educational contexts remains limited. Among the awareness items, teachers reported the highest familiarity with automated grading systems ($M = 3.89$, $SD = 0.91$) and the lowest familiarity with AI-powered content generation tools ($M = 2.74$, $SD = 1.02$). This disparity suggests that teachers' awareness of AI is largely confined to applications they encounter in their professional practice, with less exposure to emerging and more sophisticated AI tools.

Perceived benefits of AI in education

A substantial majority of teachers (68.4%) agreed or strongly agreed that AI has the potential to enhance personalized learning experiences. As illustrated in Figure 1, the most widely recognized benefit was personalized learning (78.2%), followed by automated assessment (71.6%), content recommendation (65.3%), student engagement (62.1%), and administrative efficiency (58.9%). These findings align with the theoretical assertions of Holmes et al. (1), who argued that AI's capacity to adapt instruction to individual learner needs represents one of its most significant contributions to education. The relatively high endorsement of personalized learning benefits may reflect teachers' firsthand experience with diverse student populations and their recognition of the limitations of one-size-fits-all instructional approaches (17). The strong support for automated assessment is particularly noteworthy, as it suggests that teachers view AI as a means of reducing their workload in areas that are often perceived as time-consuming and repetitive (18).

Perceived challenges of AI in education

Despite acknowledging the potential benefits, teachers expressed significant concerns regarding AI integration. Data privacy emerged as the most prominent challenge, with 72.3% of participants expressing concern about the protection of student information in AI-driven systems. This finding resonates with the broader discourse on ethical considerations in AI, as highlighted by UNESCO (5) and Williamson (19), who emphasized that data governance remains a critical challenge in the deployment of AI in education. The fear of role displacement was the second most cited concern (61.1%), indicating that a considerable proportion of teachers perceive AI as a potential threat to their professional identity and employment security. This concern is consistent with the findings of Luckin (4), who cautioned that public narratives about AI replacing human labor, while often exaggerated, can generate genuine anxiety among educators. Additional challenges included lack of training (58.9%), inadequate technical infrastructure (54.7%), and broader ethical concerns (52.6%).

Influence of prior training and demographics

Independent samples t-test analysis revealed a statistically significant difference in attitudes toward AI between teachers who had received prior AI training ($M = 4.12$, $SD = 0.68$) and those who had not ($M = 3.41$, $SD = 0.93$), $t(283) = 4.23$, $p < 0.001$. This finding underscores the critical importance of professional development in shaping teacher attitudes, a conclusion that is supported by the broader technology acceptance literature (8,20). Teachers who had participated in AI-related workshops or courses demonstrated greater confidence in their ability to integrate AI tools and expressed more favorable attitudes overall. Gender-based analysis showed no statistically significant difference in attitudes between male ($M = 3.67$, $SD = 0.91$) and female ($M = 3.72$, $SD = 0.88$) teachers, $t(283) = 0.52$, $p = 0.603$. Similarly, one-way ANOVA did not reveal significant differences in attitudes across teaching experience groups, $F(2, 282) = 1.47$, $p = 0.232$, suggesting that attitudes toward AI are not significantly influenced by the number of years a teacher has been in the profession.

Discussion synthesis

The findings of this study present a nuanced picture of teachers' perceptions towards AI in education. Teachers recognize the substantial benefits that AI can offer, particularly in areas of personalized learning and assessment automation, while simultaneously expressing legitimate concerns about data privacy, professional displacement, and inadequate preparation. This dual perspective is consistent with the concept of ambivalent attitudes toward technology, where individuals simultaneously hold positive and negative evaluations of a technological innovation (21). The significant influence of prior AI training on attitudes represents a key finding with direct practical implications. It suggests that investment in structured, accessible professional development programs could serve as a lever for promoting more positive and informed attitudes toward AI among educators (22). The lack of significant gender and experience-based differences indicates that attitudes toward AI are relatively uniform across the teaching profession, suggesting that interventions need not be differentially designed for specific demographic subgroups.

5. CONCLUSION

This research explores teachers' awareness of AI and their attitudes regarding its integration into instruction, identifying their moderate awareness level and mixed perspective on the pros and cons of using AI. Teachers recognized the potential of AI to revolutionize certain aspects of teaching, such as personalized learning and automated assessment. But data privacy, role displacement, and lack of institutional support were recurring issues and deserving of careful attention from education stakeholders. The positive effect of previous AI training on teachers' attitudes underlines the need for investing in comprehensive professional development programs that enable teachers to acquire knowledge and skills to confidently interact with AI technologies. There is a need to focus on the creation of robust frameworks for integrating AI in education that span ethical, technical, and pedagogical aspects. Educational institutions and policymakers should emphasize the need for developing comprehensive frameworks for AI integration in education, encompassing ethical, technical, and pedagogical considerations. Longitudinal studies are recommended

for future research to investigate changes in teacher perceptions over time as AI technology becomes increasingly integrated in educational practices, as well as to study the correlation between teacher perceptions and actual usage of AI tools in classrooms.

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CONFLICTS OF INTEREST

Author A declares no conflicts of interest. Author B declares no conflicts of interest. Author C declares no conflicts of interest.

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