OPEN ACCESS

Manuscript ID:
EDU-2025-13049290

Volume: 13

Issue: 4

Month: September

Year: 2025

P-ISSN: 2320-2653

E-ISSN: 2582-1334

Received: 14.07.2025

Accepted: 20.08.2025

Published Online: 01.09.2025

Citation:
Paiwithayasiritham, C., Mingsiritham, K., Sinthaworn, W., & Meesakul, P. (2025). AI Adoption in Authentic Online Assessment: An Integrated TPB–TAM Framework for Teachers in Technology-Enhanced Learning Contexts. *Shanlax International Journal of Educationa, 13*(4), 8–18.

DOI:
https://doi.org/10.34293/education.v13i4.9290

Modeling the Determinants of AI Adoption in Authentic Online Assessment: An Integrated TPB–TAM Framework for Teachers in Technology-Enhanced Learning Contexts

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Abstract
In the current era where artificial intelligence technology plays an increasingly important role in education, teachers are increasingly interested in applying AI to enhance learning efficiency and assessment. However, the acceptance of AI in assessment remains diverse, both helping to make education more equal and effective. At the same time, some are concerned that AI may replace the role of teachers or cause negative impacts. This study aimed to create a causal model explaining the determinants of the use of artificial intelligence (AI) in assessing real-world online learning outcomes of teachers in basic education by integrating the conceptual frameworks of the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB). It covered both technology perception factors, namely Trust in AI, Barriers to AI Adoption, Technology Self-Efficacy, and planned behavioral factors, namely Attitude Toward Behavior, Subjective Norms, and Perceived Behavioral Control, to predict teachers' behaviors to accept AI in real-world online assessments. The sample consisted of 260 basic education teachers, selected by multi-stage random sampling in schools that used online assessments. A five-point scale questionnaire was employed as a research tool which was tested for content validity and internal reliability. Structural Equation Modeling (SEM) was used as data analysis. The results showed that the model demonstrated excellent fit indices (GFI = 1.000, AGFI = 0.997, RMSEA = 0.000), and explained 79.1% of the variance in AI adoption behavior (R^2 = 0.791). The proposed causal model could explain the variance in AI usage behaviour significantly, where the variable of AI adoption in teachers' real-world online assessment (AAB) was directly influenced by the variables of attitude toward AI use in assessment (ATB), social norms (SN), perceived behavioral control (PBC), AI trust (TA), and technology self-confidence (TSF), all of which were statistically significant. In addition, the high barriers to AI use had a negative effect, indicating that teachers were less likely to adopt AI in real-world online assessments. This finding indicates that teachers make rational decisions to accept technology based on perceived value, rather than social pressure. The promotion of AI should focus on developing teachers' knowledge and skills, along with creating a supportive environment that reduces the difficulty of using such technology, and avoiding direct enforcement through orders or regulations. Future research should explore longitudinal trends and include contextual or institutional variables that may affect teachers' decision-making regarding AI use.

Keywords: Artificial Intelligence, Authentic Online Assessment, Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), Technology-Enhanced Learning

Introduction

Artificial Intelligence (AI) is currently playing an increasingly important role in the education system. Teaching & Learning including evaluation methods, are undergoing major changes. Teachers and educational institutions are keen to use AI to improve the learning and assessment process. The adoption of AI presents many opportunities and challenges, from personalised learning curation to automated grading and feedback. Some are optimistic and believe that AI will make education more equitable and effective. While some are concerned that AI may replace the role of teachers or have negative impacts, such as increased academic fraud (Lee & Han, 2021; Reiss, 2021). Furthermore, during the COVID-19 pandemic, the use of digital technologies and AI in online teaching and learning, including online student assessment, has increased rapidly, resulting in a significant increase in interest in using AI in this context (Chatwattana et al., 2024; Asiksoy, 2024; Chen et al., 2020).

The implementation of authentic assessments faces several challenges, such as resistance or lack of acceptance from some stakeholders, such as teachers or students who are accustomed to traditional tests, and the need for appropriate training or resources to design and implement such assessments (Akbari et al., 2022). A systematic review of the literature by Vlachopoulos & Makri (2024) found that while authentic assessments can help develop essential skills and increase students' employability, their effective implementation still requires comprehensive support. Teacher acceptance is a key factor in making this type of assessment possible in the classroom. The use of AI in real-world online assessments is an exciting new trend that could help support more effective and sustainable assessments. AI can help detect patterns in student responses or performance, analyze learning data to provide personalized feedback, and act as real-time teaching assistants to check student accuracy or progress.

Using AI in assessments is expected to reduce teachers' assessment workloads and the time spent on grading. and increases the continuity of providing immediate feedback to students (Berg & Papadopoulos, 2024). AI can also increase the reliability and accuracy of assessments, such as using plagiarism or cheating detection systems via cameras and behavioral analysis (AI proctoring) (Caleb, 2025), as well as providing standardized scores for essays or open-ended questions. However, the use of AI in assessments also raises issues that need to be considered, such as the transparency and trustworthiness of the AI system. Teachers and students need to understand how the AI works and trust that the system will assess fairly, as well as the relationship between teachers and students. Some research suggests that the use of AI in assessment may reduce engagement between teachers and students, as assessment is part of the learning process where teachers interact with students and develop professional skills. If AI takes over all assessment tasks, teachers may lose the opportunity to practice assessment skills (Berg and Papadopoulos, 2024). Therefore, although AI opens new opportunities for learning assessment, it is still necessary to understand the factors that influence teachers' decisions to accept or reject the use of this technology.

This research aims to develop a causal model that explains the factors that determine the behavior of using artificial intelligence (AI) in assessing online learning in a real-world setting for primary school teachers. This is done by integrating the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB). The research model covers both technology perception factors, including confidence in AI, barriers to AI adoption, and technology self-efficacy, as well as planned behavioral factors, including behavioral attitudes, subjective norms, and perceived behavioral control, to predict teachers' behaviors toward accepting AI in real-world online assessments. The study addresses the following research questions: (1) What factors significantly predict AI adoption among basic education teachers and (2) How do TAM and TPB variables interact to influence adoption behavior.

Literature Review

Authentic assessment is an assessment approach that focuses on enabling learners to demonstrate their abilities through tasks or situations that are close to the application of knowledge in the real world, rather than simply measuring them through objective tests or memorization (Vlachopoulos and Makri, 2024). Authentic online assessments use digital platforms

that reflect real-world situations to measure learners' knowledge and skills. Examples include virtual problem-solving assignments, electronic portfolios, or online simulation-based assessments. In recent years, there has been an increasing demand for authentic assessments to develop 21st century skills and increase learners' career readiness (Ajjawi et al., 2023). A large body of research supports the idea that the use of digital technologies can provide meaningful learning experiences and promote critical thinking and creative problem-solving in learners, enabling them to engage in active and collaborative learning. It can develop the skills needed to cope with the complexities of a rapidly changing digital world (Guzzomi et al., 2017; Collins, 2022; Al-Ghazo, 2023). However, the implementation of authentic assessments faces several challenges, such as resistance or rejection from some stakeholders, including teachers or learners who are accustomed to traditional testing, and the need for appropriate training or resources to design and implement such assessments (Akbari et al., 2022). According to a systematic literature review by Vlachopoulos & Makri (2024), although authentic assessments can help develop important skills and increase learners' employability, their effective implementation requires comprehensive support and buy-in from teachers, which are key factors in making such assessments a reality in the classroom. In an era in where digital technology plays a major role in education, the use of artificial intelligence (AI) in authentic online assessments has become an interesting trend with the potential to sustainably improve the quality of assessment. AI can help create diverse assessment environments that are relevant to the learner's real context, such as simulations, real-time feedback, And tailoring assessment formats to individual learners. For example, Karadağ (2023) found that AI improved the efficiency of automated feedback and reduced teacher workload, while Furze et al. (2024) developed the AI Assessment Scale (AIAS) to promote assessment design that emphasizes critical thinking and reduces academic fraud. Akbar (2025) also proposed a tool that helps teachers design assessments that emphasize higher-order thinking based on Bloom's Taxonomy to prevent reliance on AI in student work. Integrating AI into learning assessments not only increases the efficiency and sustainability of assessments, but also promotes meaningful learning and develops learners' critical thinking skills in the long run. Therefore, while AI opens up new opportunities for learning assessment, it is still necessary to understand the factors that influence teachers' decisions to accept or reject the use of this technology.

Teachers' technology acceptance is an ongoing topic in education. Understanding what factors that influence teachers' decisions to use or not use technological innovations is important, because teachers play a key role in implementing innovations with their learners. Over the past decades, the Technology Acceptance Model (TAM) has been widely used to explain technology acceptance in various fields, including education. TAM identifies key factors that determine the acceptance of new technology systems, which in turn affect users' attitudes toward the technology and ultimately their intention to use it. Lu et al. (2024) research found that TAM can effectively explain the acceptance behavior of educational tools and platforms, such as the acceptance of e-learning systems, online platforms, or mobile applications. Teachers or learners who perceive technology as useful for teaching and learning and as easy to use tend to have a more positive attitude and are more ready to use technology. However, TAM alone may not be able to fully explain other social or contextual factors, as traditional TAMs focus primarily on user perceptions, such as convenience and personal usefulness, excluding the element of social influence (Kundu, 2018; Zalah, 2018). To fill in the gaps and increase the power of the TAM in predicting behavior, many researchers have therefore turned to or modified the model to include social and self-regulatory factors. One of the theories that has gained attention is Ajzen's Theory of Planned Behavior (TPB), which emphasizes that an individual's intended behavior is determined by three main components: attitudes toward behavior, subjective norms (SN) or pressure from others to act or not to act, and perceived behavioral control (PBC), which refers to the degree to which an individual feels they can control or successfully perform a behavior (Lu et al., 2024). The TPB has been used to explain the

acceptance of several educational technologies, such as the acceptance of online teaching and the use of new media in the classroom. It was found that support from administrators or colleagues (SN) and teachers' confidence in their technology skills (PBC) were significant factors affecting their intention to use technology. Therefore, integrating the TAM and TPB frameworks is an effective approach for studying technology acceptance. This is because it covers both the perspective of technology usability and the perspective of external influences on users. By combining them, we can obtain a model that looks at technology acceptance behavior more comprehensively. That is, in addition to considering how useful and easy users perceive the technology to be (TAM theory), it also considers the extent to which users are influenced by social support or expectations and how much they feel in control of their technology use (TPB theory). Many studies on technology acceptance among students in educational contexts, especially technology perception factors, including planned behavioral factors, such as the research of Choung et al. (2022) found that trust in AI affects the intention to use AI technology through users' perceived usefulness and attitudes toward AI, with trust in AI functionality having a greater impact on use intention than trust in the human characteristics of AI. In addition, the research of Guo et al. (2024) developed an instrument to measure AI acceptance in education by combining factors such as perceived usefulness, perceived ease of use, intention to use, self-confidence, and anxiety. Consistent with the TAM and TPB frameworks in terms of social norms and perceived behavioral control, Liu (2025) found that social norms play an important role in promoting university teachers' intention to adopt AI, with both direct and indirect effects through confidence and readiness to use AI.

In the context of basic education teachers and their behavior in using AI in real-world online assessments, which is still a new and specific topic, there is still limited past research directly related to this topic. However, it is possible to refer to related research for guidance, such as the research of Lu et al. (2024), who studied the acceptance of AIGC technology, an AI that can generate content such as ChatGPT for teachers. It was found that TAM factors, such as perceived usefulness and ease of use, significantly affected the intention to use through teachers' attitudes. Among the TPB factors, perceived controllability had a significant positive effect on intention, whereas social norms had no clear effect on teachers' intentions in such a context. This finding is consistent with the idea that teachers tend to use personal empirical reasons, such as self-confidence and confidence, rather than following pressure or orders from others, in deciding to adopt new technologies. It can be seen that both technology awareness and planned behavior have a significant positive effect on teachers' behavior in accepting AI in online assessment in real-world situations. Based on the above background and concepts, the research hypotheses are proposed as follows:

- **H_1**: Attitude toward behavior (ATB) has a significant influence on AI acceptance behavior for online assessment (AAB).
- **H_2**: Subjective norm (SN) have a significant influence on AI acceptance behavior for online assessment (AAB).
- **H_3**: Perceived behavioral control (PBC) has a significant influence on AI acceptance behavior for online assessment (AAB).
- **H_4**: Trust in AI (TA) has a significant influence on AI acceptance behavior for online assessment (AAB).
- **H_5**: Barriers to AI adoption (BAA) has a significant negative influence on AI adoption behavior for online assessment (AAB).
- **H_6**: Technology self-confidence (TSF) has a significant influence on AI adoption behavior for online assessment (AAB).

Materials and Methods

Context and Participants

The research was conducted in the context of a basic education school that has integrated technology-enhanced learning and has already implemented some online student assessment. The selected educational area is in a period when there is a policy to continuously promote the use of digital and AI in learning management. The research participants were 260 primary and secondary teachers in the area, covering a variety of learning subjects. These teachers were invited to voluntarily

participate in the questionnaire through coordination with school administrators and the educational area office. In the sample group, approximately 79% were female and 21% were male, with an average age of 41-50 years and an average teaching experience of 5-10 years. Most participants (approximately 80%) had experience in organizing online learning and using digital tools for teaching. Some had received training on the use of AI in education, but most had never directly used AI to help assess learning outcomes, making this context appropriate for studying teachers' AI use behavior.

Instrument and Data Collection

The main research instrument was a multiple-choice questionnaire, which was divided into 3 sections: (1) general information of the respondents (gender, age, teaching experience and experience in using AI), (2) the research framework variable measurement form, and (3) open-ended questions for respondents to provide additional opinions on the use of AI in assessment (to collect additional qualitative data). However, this research will focus mainly on the quantitative data analysis from Part 2. The measured variables include: attitude toward behavior (ATB), subjective norms (SN), perceived behavioral control (PBC), trust in AI (TA), barriers to AI adoption (BAA), technology self-efficacy (TSF), and AI adoption behavior (AAB). Each variable is measured with a set of 4-5 sub-items adapted from Davis and Ajzen's instrument (which is widely used in online education contexts) and adapted to the context of AI in assessment (TA example: "I am confident that AI is accurate in analyzing data for assessment" and TSF example: "I can learn to use AI systems to assist in assessing students by myself"). The ATB, SN, and PBC measurement questions are adapted from the TPB framework questionnaire of Ajzen adapted the content to the context of AI use (sample SN: "I feel that my agency expects me to use AI in assessment" and PBC: "I have sufficient skills to use AI systems to assess learners online") (see Table 1). Each question used a 5-point Likert-type scale (1 = strongly disagree to 5 = strongly agree) to allow respondents to indicate their level of agreement.

Table 1 Design and Sources of Observational Variables

Latent Variable	Content of Variable Measurement	Source of Variables
Attitude Toward Behavior (ATB)	ATB1: I feel that the use of AI in student assessment is an appropriate approach for the current era. ATB2: I have a positive attitude towards the use of AI in the real-world assessment of students. ATB3: I believe that the use of AI will improve the quality of educational assessment. ATB4: I am interested and willing to learn how to use AI in student assessment.	Ajzen
Subjective Norms (SN)	SN1: I think I should use AI in a real-world online assessment. SN2: My colleagues support the use of AI in student assessment. SN3: I feel that my organization expects me to use AI in assessment. SN4: My organization supports the use of new technologies such as AI in learning assessment.	Ajzen Liu (2025)
Perceived Behavioral Control (PBC)	PBC1: I have sufficient skills to use AI systems for online student assessment. PBC2: I am confident that if AI is required for assessment, I can do it myself. PBC3: I have easy access to the resources or equipment needed to use AI for assessment. PBC4: I can set up a teaching environment that is conducive to the use of AI in assessment.	Ajzen Lu et al. (2024) Guo et al. (2024)

Trust in AI (TA)	TA1: I believe that AI can assess students objectively and without bias. TA2: I am confident that AI is accurate in analyzing data for assessment. TA3: I believe that AI will not leak or misuse student data. TA4: I feel safe using AI to help assess students online. TA5: I believe that AI can work effectively with teachers in assessment.	Davis Choung et al. (2022)
Barriers to AI Adoption (BAA)	BAA1: Applying AI to real-world online assessments for my work requires me to spend more time planning. BAA2: I am concerned about the ethical implications of using AI in real-world online assessments. BAA3: Given my current workload, this is a limitation to my ability to explore the use of AI in real-world online assessments. BAA4: Cost is a major barrier. In the application of AI in real-world online assessment BAA5: I am concerned about the accuracy, transparency, and fairness of AI in providing accurate and unbiased assessments.	Davis Kundu (2018) Zalah (2018) Guo et al. (2024)
Technology Self-Efficacy (TSF)	TSF1: I can learn to use AI systems to help me assess students by myself. TSF2: I am confident that I can use AI-based online assessment tools correctly and efficiently. TSF3: I can quickly adapt to new technologies related to student assessment. TSF4: I can troubleshoot basic technical issues that arise when using AI systems.	Davis Guo et al. (2024)
AI Adoption Behavior (AAB)	AAB1: I have used AI systems to help me assess student learning online. AAB2: I have implemented AI as part of my real-world assessment process in my classroom. AAB3: I plan to continue to use AI in my teaching in the future. AAB4: I can recommend AI applications for different forms of assessment.	Davis Choung et al. (2022) Guo et al. (2024) Liu (2025)

Data Analysis

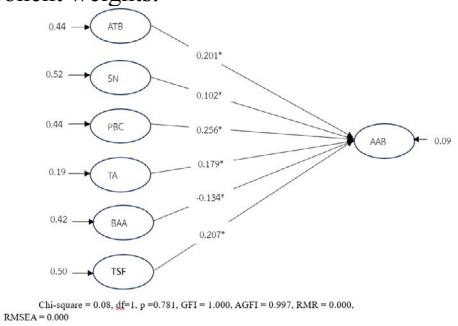
The obtained data were recorded and checked for completeness and accuracy. Then, the analysis was performed using advanced inferential statistics, namely Structural Equation Modeling (SEM) using LISREL 8.80 (Student Edition) software. The criteria for considering the model consistency were GFI>.95, AGFI>.90, RMSEA<.05, and RMR<.08 (Byrne, 1994).

Result

The data analysis in this section presents the results of the analysis to examine the consistency of the model of factors influencing the use of AI in evaluating online teachers in the real world using empirical data. In this research step, there is one latent endogenous variable, namely AI adoption behavior (AAB), and six latent endogenous variables, attitude toward behavior (ATB), subjective norm (SN), perceived behavioral control (PBC), trust in AI (TA), barriers to AI adoption (BAA), and technological self-efficacy (TSF).

Model of factors influencing the use of AI in evaluating online teachers in the real world using empirical data. The results of the model analysis, according to the initial conceptual framework, found that the model was not consistent with the empirical data. Therefore, the researcher adjusted the model of factors influencing the use of AI in evaluating online teachers in the real world by considering

the model adjustment index, which will help find the relationship between errors. It was found that the model of factors influencing the use of AI in evaluating online teachers in the real world was consistent with the empirical data, with standardized component weights.



Note *Statistically significant ($p<0.05$)

Figure 1 Model of Factors Affecting the Adoption of AI in Real-world Online Assessment of Teachers

The structural model, according to the conceptual framework of Figure 1, was analysed to test hypotheses H_1–H_6. The results of the structural equation model analysis found that the model fit was satisfactory ($\chi^2 = 0.08$, df = 1, p = 0.781, GFI = 1.000, AGFI = 0.997, RMR = 0.000, RMSEA = 0.000), indicating that the model fit the empirical data well. When considering the path coefficients and the significance of the various causal paths, it was found that out of all 6 hypotheses supported by the data, they are summarized as follows:

- **H_1**: ATB → AAB is supported ($\beta = 0.201$, $p < 0.05$), indicating that teachers with positive attitude toward behavior AI in assessment will use AI in real-world online assessments, which is consistent with the TAM concept that when technology is easy to use Users will perceive more benefits.
- **H_2**: SN → AAB is supported ($\beta = 0.102$, $p < 0.05$), indicating that teachers with subjective norm will use AI in real-world online assessments.
- **H_3**: PBC → AAB is supported ($\beta = 0.256$, $p < 0.05$), indicating that teachers with perceived behavioral control will use AI in real-world online assessments.
- **H_4**: TA → AAB is supported ($\beta = 0.179$, $p < 0.05$), indicating that teachers with trust in AI will use AI in real-world online assessments.
- **H_5**: BAA → AAB is supported ($\beta = -0.134$, $p < 0.05$), indicating that barriers to AI adoption negative effect on the use of AI in real-world online assessment
- **H_6**: TSF → AAB is supported ($\beta = 0.207$, $p < 0.05$), indicating that technology self-efficacy will lead to teachers' use of AI in real-world online assessment.

When considering the statistical values used to check the consistency between the model and the empirical data, it was found that the model was consistent with the empirical data, as considered from the Chi-square value, which was equal to 0.08 at 1 degree of freedom, the probability value (p) was equal to 0.781, the Goodness-of-Fitness Index (GFI) was equal to 1.000, the Adjusted Goodness-of-Fitness Index (AGFI) was equal to 0.997, and the Root Mean Square Residuals (RMR) was equal to 0.000. From the above data, it can be seen that the p-value is large enough not to reject the hypothesis. The GFI and AGFI values are close to 1, and the RMR value is close to zero. Therefore, the hypothesis that the hypothesized model is consistent with the empirical data is accepted.

When considering the direct and combined influences on the use of AI in real-world online assessment by teachers, it was found that the variable of AI adoption behavior (AAB) was directly influenced by the variables of attitude toward behavior (ATB), subjective norm (SN), perceived behavioral control (PBC), trust in AI (TA), and technology self-efficacy (TSF) with statistically significant positive effects, almost all of which had influence values of 0.201, 0.102, 0.256, 0.179, and 0.207, respectively. This indicates that if teachers have higher attitude toward behavior, subjective norm, perceived behavioral control, trust in AI, and technology self-efficacy, it will result in more teachers using AI in real-world online assessments. As for the variable of barriers to AI adoption (BAA), which was found to be statistically significant, it had an influence value of -0.134, indicating that if there are many obstacles to AI use, it will result in less AI adoption behavior in real-world online assessment.

Table 2 Analysis Results of The Model of Factors Influencing The use of Artificial Intelligence in The Real-World Online Assessment of Teachers

Effect Variable	The Use of Artificial Intelligence in The Real-World Online Assessment of Teachers		
Cause variable	DE	IE	TE
Attitude Toward Behavior (ATB)	0.201	-	0.201
Subjective Norms (SN)	0.102	-	0.102
Perceived Behavioral Control (PBC)	0.256	-	0.256
Trust in AI (TA)	0.179	-	0.179
Barriers to AI Adoption (BAA)	-0.134	-	-0.134
Technology Self-Efficacy (TSF)	0.207	-	0.207
Statistical value Chi-square = 0.08, df = 1, p = 0.781, GFI = 1.000, AGFI = 0.997, RMR = 0.000, RMSEA = 0.000			

When considering the predictive coefficient (R SQUARE) of the variable of AI adoption in teachers' real online assessment, it is equal to 0.791, indicating that the variables in the model can explain 79.1 percent of the variance in the variable of AI adoption in teachers' real online assessment. When considering the correlation matrix between latent variables, it was found that the latent variables with moderate to high correlation (0.505<r<0.819) were subjective norm (SN) variable and attitude toward behavior (ATB) (r=0.819), which had the highest correlation, followed by the variable of perceived behavioral control (PBC) and attitude toward behavior (ATB) (r=745), and the variable of trust in AI (TA) and perceived behavioral control (PBC) (r=0.505), which had the lowest correlation.

Table 3 Correlation Matrix Between Latent Variables

Structural equation of AI implementation variables in the real-world online assessment of teachers						
R SQUARE		0.791				
Latent Variable Correlation Matrix						
Latent Variables	**ATB**	**SN**	**PBC**	**TA**	**BAA**	**TSF**
ATB	1.000					
SN	0.819**	1.000				
PBC	0.745**	0.724**	1.000			
TA	0.584**	0.515**	0.505**	1.000		
BAA	-0.540**	-0.568**	-0.568**	-0.551**	1.000	
TSF	0.665**	0.682**	0.810**	0.522**	-0.594**	1.000

Discussion

The results of this study provide a better understanding of teachers' behaviors regarding the use of Artificial Intelligence (AI) in the context of online learning assessment. The results aligned with the integrated framework of the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB), which showed that various factors influence AI adoption behavior.

Technology Perceived Factors (TAM)

This study revealed that technology-related factors, trust in AI (TA) and technology self-efficacy (TSF), served as fundamental antecedents to the formation of positive attitudes and intentions toward AI use. At the same time, the AI tools needed to avoid excessively increasing teachers' workload. When AI is seen as a useful aide rather than a burden, teachers tend to be more open and willing to experiment.

These findings were consistent with a study by Tarraga-Minguez & Sanz (2021), who found that

faculty who believed AI-assisted systems provided multiple benefits, such as facilitating documentation and reducing grading time, showed greater readiness to adopt and learn new technologies. Moreover, when the technology was designed to be user-friendly, with an intuitive interface and minimal technical demands, teachers appeared even more willing to accept it. Whether AI was perceived as reducing or increasing the teachers' workload depended largely on its design and the teachers' perceptions. Teachers who saw AI as a tool that made their work easier and more efficient were more likely to use it to support their teaching. Conversely, if AI is perceived as complex or requires significant modification, they are more likely to be opposed. Therefore, it is recommended that technology developers focus on practical usability and communicate their practical benefits to teachers.

Behavioral Intention (TPB) Factor

This study also confirmed that attitudes had the strongest influence on AI use behavior, focusing on the role of internal personal factors, in this case, teachers' feelings about using AI. In this study, the majority of respondents had no direct experience using AI for educational assessment, so their attitudes were often shaped by their imagination, data, and media exposure to AI. The finding that the majority of participants held positive attitudes suggests that many teachers are open to the idea of using AI. This positive trend may reflect the broader educational context post-COVID-19, where teachers are more comfortable using new technologies and more open to experimenting with innovations such as AI (El Jihaoui et al., 2024). It has been suggested that institutions should support the use of AI rather than mandating it. Emphasis should be placed on fostering positive attitudes through the dissemination of accurate information. Demonstrate tangible benefits and provide training sessions that allow teachers to gain hands-on experience with AI tools to promote positive experiences and reduce anxiety. This recommendation echoes that of Lu et al. (2024), who argued that teachers should not be forced to use AI through instruction or command. Instead, it is believed that gradual encouragement and guidance are more effective strategies for developing thoughtful but positive attitudes toward AI use.

Suggestions

The results helped fill a gap in the academic literature on the acceptance of educational innovations, especially in the area of online assessment, which has become increasingly important in the post-COVID-19 era. In practice, the results could provide information to educational agencies, school administrators, And AI developers who want to improve the adoption and effective integration of AI in educational environments, suggested strategies include: (1) Developing AI systems and training programs that are user-friendly and provide clear and useful outcomes for teachers to promote positive attitudes (supporting ATB and trust in AI - TA), (2) Creating a supportive environment where teachers feel confident and in control, such as providing user guides, technical support teams, accessible learning resources, and sufficient time for learning (improving Subjective Norm - SN and TSF), and (3) Promoting AI adoption through strategies that support rather than direct, such as establishing AI-focused teacher learning communities and offering incentives or acceptance, can promote voluntary and intrinsically motivated adoption (reinforcing PBC and BAA).

Conclusion

This study examined the factors influencing teachers' acceptance of artificial intelligence (AI) in real-world online student assessments, using an integrated TAM–TPB framework that encompasses both technology and user behavior dimensions. Analysis of responses from 260 teachers confirmed that the TAM–TPB model significantly explained teachers' acceptance behavior of AI. Among the influencing variables, perceived behavioral control (PBC) emerged as the most influential factor influencing intention, followed by technology self-efficacy (TSF) and attitude toward behavior (ATB). The results indicated that teachers were more likely to accept AI when they perceived it as truly useful, easy to use, and when they had a positive attitude toward its use and felt confident in successfully using AI. External pressure or instructions from others appeared to have less influence than teachers' internal judgment. These results had both theoretical and practical implications. Theoretically, this study supported the generalizability of the TAM–TPB

model in a new context: the adoption of AI in the Thai education system, a topic that had not been sufficiently explored.

Limitations of the Study and Future Research Directions

Although this study provides valuable insights into teachers' acceptance of AI, several limitations should be acknowledged and addressed in future research:

Sample Scope: The sample of 260 teachers was limited to a certain region and time frame, which may not fully represent the views of all teachers in a country or diverse contexts. Therefore, caution should be exercised when generalizing the results to other populations. Future research should aim to expand the sample size and diversity, including teachers from different geographic areas and types of schools, to enhance the generalizability of the findings.

Cross-Sectional Design: Data were collected using a cross-sectional design, reflecting teachers' perceptions over a while. These perceptions and attitudes toward AI may evolve with new experiences or over time. Longitudinal studies would be useful to track the development of attitudes and intentions, providing clearer insights into causal relationships. and assess the robustness of the model over time.

Other Influential Variables: While the model used in this study focused on key TAM–TPB variables and provided satisfactory explanatory power, factors other than those in the model may also influence teachers' intentions to use AI. Future studies could incorporate external or domain-specific variables related to AI in assessment to improve predictive power and expand our understanding of teachers' behaviors.

In summary, future research should aim to extend and deepen the insights gained from this study by including a more diverse group of participants, broadening the scope of influential factors, and incorporating additional variables. Such efforts would contribute to a more comprehensive understanding of the acceptability of AI in student assessment, a topic of increasing relevance in the rapidly changing digital education landscape.

References

Akbari, M., Nguyen, H. M., McClelland, R., & Van Houdt, K. (2022). Design, implementation and academic perspectives on authentic assessment for applied business higher education in a top performing Asian economy. *Education + Training, 64*(1), 69-88.

Al-Ghazo, A. (2023). Authentic assessment strategies used to improve distance learning outcomes. *Journal of Applied Linguistics and Language Research, 10*(2), 16-28.

Ajjawi, R., Tai, J., Dollinger, M., Dawson, P., Boud, D., & Bearman, M. (2023). From authentic assessment to authenticity in assessment: Broadening perspectives. *Assessment & Evaluation in Higher Education, 49*(4), 499-510.

Akbar, M. S. (2025). Beyond detection: Designing AI-resilient assessments with automated feedback tool to foster critical thinking. *Computers and Society*.

Asiksoy, G. (2024). An investigation of university tudents' attitudes towards artificial intelligence ethics. *International Journal of Engineering Pedagogy, 14*(8), 153-169.

Berg, S., & Papadopoulos, P. M. (2024). Summative assessment with artificial intelligence: Qualitative analysis and comparison of technology acceptance in student and teacher populations. *Innovations in Education and Teaching International*.

Caleb, G. (2025). Authentic assessment as an alternative to online proctoring. *Ball State University Teaching Innovation Blog*.

Chatwattana, P., Yangthisarn, P., & Tabubpha, A. (2024). The educational recommendation system with artificial intelligence chatbot: A case study in Thailand. *International Journal of Engineering Pedagogy, 14*(5), 51-64.

Chen, X., Xie, H., Zou, D., & Hwang, G. (2020). Application and theory gaps during the rise of artificial intelligence in education. *Computers and Education: Artificial Intelligence, 1*.

Choung, H., David, P., & Ross, A. (2022). Trust in AI and its role in the acceptance of AI technologies. *International Journal of Human-Computer Interaction, 39*(19), 1727-1732.

Collins, T. (2022). Authentic assessment – The right choice for students studying law? *Legal Education Review, 32*(1), 1-18.

El Jihaoui, M., Abra, O. E. K., Mansouri, K., & Ech-Chhibat, M. E. H. (2024). Towards a literature review methodology: A practical guide in the context of using artificial intelligence in education. *International Journal of Engineering Pedagogy, 14*(7), 119-145.

Guo, S., Shi, L., & Zhai, X. (2024). Validating an instrument for teachers' acceptance of artificial intelligence in education. *Education and Information Technologies*.

Guzzomi, A. L., Male, S. A., & Miller, K. (2017). Students' responses to authentic assessment designed to develop commitment to performing at their best. *European Journal of Engineering Education, 42*(3), 219-240.

Furze, L., Perkins, M., Roe, J., & MacVaugh, J. (2024). The AI Assessment Scale (AIAS) in action: A pilot implementation of GenAI supported assessment. *Australasian Journal of Educational Technology, 40*(4), 38-55.

Karadağ, N. (2023). The impact of artificial intelligence on online assessment: A preliminary review. *Journal of Educational Technology & Online Learning, 6*(4), 822-837.

Kundu, A. (2018). A study on Indian teachers' roles and willingness to accept educational technology. *International Journal of Innovative Studies in Sociology and Humanities, 3*, 42-52.

Lee, J., & Han, S. H. (2021). *The future of service post-COVID-19 pandemic, 1*. Springer.

Liu, N. (2025). Exploring the factors influencing the adoption of artificial intelligence technology by university teachers: The mediating role of confidence and AI readiness. *BMC Psychology, 13*(1).

Lu, H., He, L., Yu, H., Pan, T., & Fu, K. (2024). A study on teachers' willingness to use generative AI technology and its influencing factors: Based on an integrated model. *Sustainability, 16*(16).

Reiss, M. J. (2021). The use of AI in education: Practicalities and ethical considerations. *London Review of Education, 19*(1), 1-14.

Tarraga-Minguez, R., Suarez-Guerrero, C., & Sanz-Cervera, P. (2021). Digital teaching competence evaluation of pre-service teachers in Spain: A review study. *IEEE Revista Iberoamericana de Tecnologias del Aprendizaje, 16*(1), 70-76.

Vlachopoulos, D., & Makri, A. (2024). A systematic literature review on authentic assessment in higher education: Best practices for the development of 21st century skills, and policy considerations. *Studies in Educational Evaluation, 83*.

Zalah, I. (2018). Factors that influence Saudi secondary teachers' acceptance and use of e-learning technologies \[Doctoral dissertation, University of Brighton].

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