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Omani Pre-Service Teachers' Preparedness and Perceptions of Integrating Artificial Intelligence into Classrooms

Moza Al Malki[1], Qasim Al Washahi[2] & Abdul Rahman Al Farsi[3]

Abstract

This study aims to examine the attitudes and readiness of Omani pre-service teachers toward implementing artificial intelligence (AI) in the classroom. The research employed the integrated technology acceptance model (TAM) to explore how these future educators perceive and prepare for AI integration. Using a mixed-methods approach that combined qualitative and quantitative data collection techniques, the study gathered insights from pre-service teachers at various higher education institutions in Oman. The results revealed that Omani pre-service teachers generally hold positive attitudes toward technology and are familiar with AI concepts. They perceive AI as a useful and user-friendly tool in education, recognizing its potential to enhance teaching and learning. Additionally, most participants expressed a willingness to incorporate AI into their teaching practices. However, several challenges were identified, including insufficient training and professional development opportunities, concerns about excessive reliance on AI tools, and the ethical implications of AI use in educational settings. Notably, a statistically significant difference was found between male and female pre-service teachers regarding their perceptions of support and resources. The study findings suggest that Omani higher education institutions must take strategic steps to prepare for AI integration. The research recommends practical approaches for integrating AI into teaching programs, emphasizing the need for comprehensive teacher training and the development of ethical guidelines. By aligning with global trends in AI education, these institutions can equip future educators with the necessary skills to effectively navigate and incorporate AI into their classrooms, ensuring it becomes a valuable tool for enhancing the learning experience.

Keywords: *Artificial intelligence, pre-service teachers, higher education institutions, technology acceptance model (TAM).*

Introduction

The integration of artificial intelligence (AI) into educational settings has gained significant global attention, particularly within higher education institutions (HEIs). As AI-powered tools become increasingly prevalent, their impact on teaching and learning has sparked discussions about how educators—particularly pre-service teachers—perceive and prepare for AI integration in

[1] *Asist. Prof, University of Technology and Applied Sciences, Rustaq College of Education, Oman,* moza.almalki@utas.edu.om
[2] *Lecturer, University of Technology and Applied Sciences, Rustaq College of Education, Oman.* qasim.alwashahi@utas.edu.om
[3] *Assist. Lecturer, University of Technology and Applied Sciences, Rustaq College of Education, Oman.* abdulrahman.alfarsi@utas.edu.om

classroom practices. This study aims to explore the preparedness and perceptions of Omani pre-service teachers regarding AI use in education, focusing on HEIs that offer teacher training programs.

Since the rapid rise in AI adoption in education—particularly following the emergence of generative AI technologies—institutions and government bodies in Oman have begun drafting policies to regulate AI use in HEIs. However, many of these policies remain in the development phase, reflecting ongoing debates about AI's ethical, pedagogical, and practical implications. As institutions navigate these challenges, understanding pre-service teachers' perceptions of AI integration becomes crucial for shaping future training programs and policies.

There is growing pressure to equip pre-service teachers with the necessary technological knowledge and skills, and their level of readiness can be influenced by several factors. One key factor is exposure to AI content within teacher education programs. As AI becomes the foundation of future careers, learning to work with it may soon be as essential as learning to read or write (Casal-Otero et al., 2023; Ng et al., 2021). These programs serve as the foundation for training and preparing future educators to become technologically competent. Frimpong (2022) conducted a study on enhancing pre-service teachers' AI literacy, finding a statistically significant improvement in their readiness for AI after participating in a training program.

Since the onset of the pandemic, both K-12 teachers and teacher educators in higher education have demonstrated a strong willingness to update their skills and embrace innovative technologies and intelligent machines. Consequently, students and pre-service teachers are also expected to develop technological proficiency. As Park and Son (2020) state, "pre-service teachers of today are expected to be in a better position to take advantage of technology in their teaching compared to their predecessors" (p. 1).

The University of Technology and Applied Sciences (UTAS), particularly Rustaq College of Education, where this study is contextualized, plays a pivotal role in fostering AI integration within teacher education programs by equipping pre-service teachers with essential digital competencies and addressing the pedagogical implications of AI-enhanced learning environments. Recent research conducted by Khalil and Alsenaidi (2024) indicates that UTAS focuses on developing professional skills that enable pre-service teachers to leverage AI in creating personalized, efficient, and engaging learning experiences. The study identified key competencies such as ethical

AI use, data management, and AI literacy as critical for effective AI integration, emphasizing the importance of continuous professional development programs.

Another recent research conducted at UTAS (Khalil et al., 2024) explored students' perspectives on the integration of AI in education, focusing on its benefits, challenges, and expectations. The results reveal that students generally perceive AI as a beneficial tool for education, reflecting an overall positive attitude toward its integration into the learning process. However, despite this optimism, concerns about potential drawbacks highlight the need for strategies to address these issues. The study suggests that while AI offers significant advantages, such as improving efficiency and accessibility in education, it is crucial to implement targeted measures to minimize risks and maximize its positive impact on learning outcomes. Additionally, this study examines the readiness and perceptions of Omani pre-service teachers in HEIs regarding the integration of AI into their teaching practices, particularly during microteaching and school-based practicum courses.

Thus, this study aims to:

- explore the readiness of pre-service teachers to integrate AI into their teaching practices,
- identify the perceptions and challenges faced by pre-service teachers regarding AI integration,
- assess the preparedness of teacher education programs to equip future educators with technological competencies, and
- propose recommendations to enhance and align Omani teacher education programs with global trends in AI integration.

The study is guided by the following research questions:

1. What are pre-service teachers' perceptions of integrating AI into their teaching?
2. To what extent are pre-service teachers prepared to integrate AI into their teaching?
3. What challenges do pre-service teachers encounter when integrating AI into their teaching?
4. What support do pre-service teachers need to effectively integrate AI into their teaching?

Literature Review

AI integration in educational practice

The integration of AI in education is transforming learning processes by enabling personalized instruction, adaptive assessments, and enhanced engagement. Studies indicate that AI tools, such

as intelligent tutoring systems and adaptive learning platforms, provide tailored learning experiences that address diverse student needs and foster inclusivity (Wangdi, 2024). These tools also improve resource efficiency and standardize learning by automating tasks like grading and content delivery.

AI integration promotes the development of critical thinking and scientific analysis skills, particularly in interdisciplinary educational contexts. However, significant challenges remain, including data privacy concerns, algorithmic bias, and the need for robust ethical frameworks (Farooqi et al., 2024). A study conducted by Chounta et al. (2021) surveyed 140 K-12 teachers from Estonia to analyze their understanding, concerns, and challenges regarding AI and its integration into education. The results showed that most respondents identified as novices in AI but maintained a positive attitude toward its pedagogical applications. More specifically, respondents supported employing AI for tasks such as lesson preparation, organizing subgroup interactions, providing tailored feedback, and adapting teaching aids to meet specific needs. Notably, concerns about AI replacing human jobs were comparatively minimal among the participants.

Thus, as the article suggests, the responsible use of AI, combined with professional development programs for educators, is critical to addressing these challenges and ensuring equitable access to education. Moreover, preparing future teachers to effectively integrate AI into their teaching practices is essential, emphasizing inclusivity and accessibility.

The existing literature broadly identifies three primary domains in which AI significantly influences education. First, in the domain of learning and instruction, AI enhances the learning experience by personalizing content, adapting systems, and offering intelligent tutoring. These technologies improve student engagement and academic outcomes (Ohlsson, 2023; Shrungare, 2023; Singh & Hiran, 2022). The principal advantage of AI in this area is its ability to personalize learning, enabling students to progress at their own pace and according to their preferred learning styles, which has been shown to lead to improved student outcomes (Baskera, 2023; Fernandes et al., 2023; Harry, 2023). Recent research indicates that AI can provide educational support and offer constructive feedback, further enhancing both learning experiences and academic performance (Alqahtani et al., 2023). Intelligent tutoring systems, chatbots, and automated grading mechanisms also increase operational efficiency, save time for educators, and deliver accurate, timely feedback (Harry, 2023).

Research has also examined the design, implementation, and evaluation of tutoring systems powered by large language models (LLMs), such as GPT-4, across different educational contexts. These systems have shown promising results, such as improved learning outcomes, increased student engagement, and enhanced instructional quality. For example, adaptive LLM-based tutoring systems those that tailor their responses to individual student needs have been linked to higher motivation and greater learning gains. One such system, Personalized Adaptive Cognitive Environment (PACE), used for teaching mathematics, led to increased student motivation and learning compared to non-adaptive LLM tutors (Liu et al., 2025).

Another system, the Socratic Playground, is designed to simulate dialogue-based learning and showed higher engagement and notable learning improvements during early trials (Liu et al., 2024). Meanwhile, Multi-Word Problem Tutor (MWPTutor) outperformed general-purpose tutors like GPT-4 in human evaluations of tutoring quality (Chowdhury et al., 2024).

LLMs have also enhanced learning across various subjects. For instance, PACE improved engagement, comprehension, and reasoning skills in mathematics. Adaptive learning paths powered by LLMs helped boost student performance and long-term retention (Ng & Fung, 2024). The Socratic Playground also contributed to gains in vocabulary, grammar, and sentence construction, with users reporting high satisfaction (Liu et al., 2024).

Recent innovations have combined LLMs with knowledge graphs (structured representations of knowledge) and memory modules to improve the personalization and reliability of instructional systems. For instance, multi-process chaining and memory integration have enhanced how these tutors adapt to individual learners (Chen et al., 2024). LLM-knowledge graph systems effectively track learner understanding and context, while multi-agent platforms like Multi-Agent Intelligent Coaching (MAIC) demonstrate scalable adaptive behavior. However, these studies also emphasize the ongoing importance of human oversight to ensure quality, maintain transparency, and mitigate potential risks.

Secondly, in the domain of assessment and evaluation, AI's capabilities in automation and data analytics are transforming grading accuracy and offering deeper insights into student performance (Martínez-Comesaña et al., 2023; Owan et al., 2023). In the area of automated feedback, LLM-generated comments often match or even exceed the quality of human feedback. These comments tend to be more detailed and better aligned with grading rubrics, which helps students reflect on and improve their work. Specifically, ChatGPT provided feedback that was more process-focused

than that of instructors and showed strong agreement with rubric-based assessments (Dai et al., 2023). Similarly, Feedback Copilot has delivered feedback that users rated as comparable to that received from a teaching assistant (Pozdniakov et al., 2024). Third, AI significantly contributes to streamlining administrative tasks, resource management, and communication processes, allowing educators to focus more on interactive teaching and student support. Several studies have indicated that AI applications in educational administration yield substantial efficiency gains across multiple domains. For example, in scheduling, AI-powered tools have demonstrated a 63% reduction in the time required and fewer scheduling conflicts, according to pilot studies (Rao et al., 2024). Regarding grading and feedback, empirical research reported a 35% reduction in grading time and faster feedback cycles for teachers (Hahn et al., 2021; Santos & Junior, 2024).

Additionally, AI-driven resource management and administrative dashboards have been associated with reduced paperwork and improved decision-making (Dwivedi et al., 2024; Rao et al., 2024). The deployment of chatbots and other communication automation tools is supported by qualitative case studies showing a reduction in routine inquiries and perceived improvements in operational efficiency (Bobro, 2024; Majorana et al., 2022). However, it is important to note that, while measurable administrative time savings are frequently documented, there is limited high-quality evidence that explicitly demonstrates that these saved hours are consistently reinvested in enhanced teaching or student support. Further research is needed to rigorously track these long-term impacts, particularly across diverse educational settings (Dwivedi et al., 2024; Hahn et al., 2021). However, these contributions emphasize AI's potential to optimize teaching strategies and operational practices (Ahmad et al., 2022; Igbokwe, 2023).

Beyond these core areas, research has also explored AI's expansion into supporting educators through professional development to improve teaching methods, enhancing student engagement through gamification, providing data-driven insights for policymaking, and fostering global learning opportunities. These supplementary domains further underscore AI's broad impact, demonstrating its capacity to enrich and diversify educational experiences.

Readiness for AI integration in teacher education

Research has explored the readiness of pre-service teachers to integrate AI into their teaching practices, revealing varying levels of acceptance and preparedness. A key finding highlights AI's potential to enhance education by providing personalized learning experiences, reducing administrative burdens, and fostering innovative teaching methods (Altinay et al., 2024). For

instance, a study by Karataş and Yüce (2024) involving 100 pre-service teachers assessed their awareness, willingness, and readiness to incorporate AI in the classroom. The findings revealed that most participants felt confident using AI tools effectively, solving technology-related problems, creating blogs and webpages, utilizing subject-specific software, conducting research for their teaching content, and employing appropriate technologies such as simulations and multimedia resources to present their subject matter. Similarly, Park and Son (2020) found that six pre-service teachers demonstrated moderate to high competence in adopting and using various digital technologies, including online quiz applications and video-sharing websites, during their school-based practicum. Likewise, in Zaugg's experimental research (2024), 78 pre-service teachers were initially skeptical about AI's usefulness in education; however, after using AI, they recognized that deploying AI tools such as chatbots for routine tasks can redirect their focus toward pedagogy and student engagement. They also indicated that they would permit their students to use AI in learning once they have first understood key concepts. Content analysis of AI-generated lesson plans reveals similar concerns, which shows that these tools produce human-like educational materials but exhibit notable limitations in technology integration (Baytak, 2024).

However, despite these advantages, pre-service teachers exhibit mixed attitudes toward adopting AI, reflecting a balance between enthusiasm for its benefits and concerns about challenges like reduced human interaction and ethical considerations (Bae et al., 2024). Notably, the willingness to integrate AI varies across cultural and educational contexts, emphasizing the need for tailored approaches in teacher training programs (Thararattanasuwan & Prachagool, 2024). Collectively, these studies suggest that while pre-service teachers recognize AI's transformative potential, its successful integration will require addressing technical, ethical, and pedagogical challenges through targeted education policies and training.

Challenges and support for AI integration in teacher education

Pre-service teachers encounter several challenges when integrating AI into educational settings, including ethical, technical, and pedagogical concerns. They worry that over-reliance on AI tools may compromise students' critical thinking and creativity. For instance, research involving Chinese pre-service teachers identified concerns about the authenticity of AI-facilitated interactions and ethical implications such as data privacy and academic integrity (Chung & Jeong, 2024). Similarly, Indonesian pre-service teachers reported ethical violations and the risk of misleading AI-generated content, although they acknowledged benefits like efficient lesson

preparation and tailored learning materials (Wulandari & Purnamaningwulan, 2024). In line with these findings, a systematic review by Celik et al. (2022) highlighted the limited reliability of AI algorithms in providing accurate information. Akgun and Greenhow (2021) also discussed the privacy challenges associated with AI integration in K-12 classrooms, noting concerns about surveillance and the collection of detailed data on students' and teachers' actions and performance. These issues raise significant concerns about the autonomy and freedom of both students and teachers. Additionally, inherent power biases embedded in AI algorithms can manifest in various educational applications—such as personalized learning, automated assessments, social networking sites, and predictive systems—thereby perpetuating forms of discrimination (Akgun & Greenhow, 2021, p. 436).

Another issue is a lack of confidence and familiarity with AI technologies, which can hinder effective integration. Studies show that pre-service teachers often experience initial anxiety toward tools like ChatGPT; however, structured training programs can mitigate these concerns and enhance their readiness to adopt AI responsibly (Bae et al., 2024). Ogurlu and Mossholder (2023) found that educators had limited knowledge about ChatGPT and expressed multiple concerns such as plagiarism, cheating, loss of higher-order thinking skills, and overreliance on technology. Despite these reservations, they remained open to receiving training about its applicability in education and recognized potential benefits in developing teaching materials and reducing workload. Moreover, practical challenges include the potential for plagiarism and the necessity to redesign assessment methods to emphasize higher-order thinking and creativity (Khlaif et al., 2025).

Furthermore, pre-service teachers require structured support to effectively integrate AI into their teaching practices, focusing on both technical proficiency and pedagogical applications. For instance, pre-service teachers in Park and Son's research (2020) reported issues such as the lack of support for Adobe software in classrooms, limited Information and Communication Technology (ICT) skills among schoolteachers, school policies prohibiting mobile phone use during school hours, and bureaucratic obstacles in the approval process for technology integration. Based on these findings, the study suggests that classroom teachers should make continuous efforts and provide support to promote and utilize ICT to enhance their teaching practices. Marais (2023) found that many pre-service teachers lack the foundational digital competencies required for effective technology integration. Although institutions provided access to devices and

connectivity, students struggled to use these technologies effectively. This indicates that digital literacy represents a fundamental challenge that teacher preparation programs must address before implementing advanced AI integration.

Given these challenges and supports, this study aims to explore the readiness and perceptions of Omani pre-service teachers regarding the integration of AI into their teaching practices, specifically during their microteaching and school-based practicum courses. The study is guided by the following research questions:

1. What are pre-service teachers' perceptions of integrating AI into their teaching?
2. To what extent are pre-service teachers prepared to integrate AI into their teaching?
3. What challenges do pre-service teachers encounter when integrating AI into their teaching?
4. What support do pre-service teachers need to effectively integrate AI into their teaching?

Methodology

Design

To effectively address the research questions, this study employed a convergent mixed-methods approach, integrating both quantitative and qualitative data collection techniques simultaneously. The quantitative component allows for numerical data quantification, facilitating statistical analysis and enabling efficient coverage of a large population, particularly to answer research questions 1 and 2. However, to gain a more comprehensive understanding of the issue, the qualitative approach complements the quantitative data by providing in-depth insights into participants' perspectives on AI integration in the classroom. Additionally, the qualitative findings help contextualize and interpret the statistical patterns and trends identified through the quantitative analysis.

The adoption of a convergent mixed-methods approach mitigates the limitations of single-method designs by balancing the strengths of both quantitative and qualitative paradigms (Dörnyei, 2007, p. 43). While large-scale surveys are particularly effective for quantitatively measuring attitudes and motivation, qualitative data offers richer, more nuanced insights that contribute to a deeper understanding of the phenomenon under investigation. This approach is particularly relevant given the exploratory nature of this study, which employs both survey data and qualitative responses to

conduct a multi-level analysis of Omani pre-service teachers' preparedness for and perceptions of AI integration in classroom practices. Furthermore, utilizing a mixed-methods design enhances the generalizability and external validity of the findings, which are key objectives of this research (Dörnyei, 2007).

Participants in the study

Although the study initially aimed to collect data from all HEIs in Oman, limited responses resulted in a convenience sample, with most participants coming from the UTAS, followed by Sultan Qaboos University (SQU). Only 14% of respondents were from other institutions. This distribution highlights the varying levels of accessibility and engagement of different HEIs with AI-related research. It is also worth noting that official communication channels were utilized to access the student populations across multiple universities in Oman. However, these attempts were unsuccessful, as responses from the institutions were delayed, limited, or unavailable, ultimately restricting the study's reach and necessitating a convenience sampling approach.

As a result, the study adopted a convenience sampling approach, with the majority of respondents drawn from the UTAS, followed by a smaller proportion from SQU. Only a minor percentage (8%) of responses were collected from other institutions. Although this sampling method was not the initial preference, it enabled the study to gather valuable insights from pre-service teachers actively engaged in teacher training programs, ensuring that the research could still achieve its core objectives despite the sampling limitations.

The 210 participants in this study are pre-service teachers currently enrolled in practicum courses or undergoing teaching training at schools as part of their teacher preparation programs. The sample comprised 47% female and 53% male participants, reflecting a relatively balanced gender distribution.

The majority of participants specialize in English Language Education, making it the most represented major in the study. However, participants also come from a diverse range of disciplines, including Biology, Mathematics, Chemistry, Physics, Islamic Culture, Educational Technology, Arabic Language, and Arts Education. All participants are bachelor's degree students preparing to join the future teaching workforce in Omani schools.

The participants come from different academic cohorts, ranging from the 2017 to 2023 batches. The largest proportion of participants (35%) belongs to the 2020–2021 cohort, followed by the 2021–2022 cohort at 26%. These groups mainly consist of final-year students who are either in the

final stages of their studies or completing their teaching training, making them a critical demographic for understanding perceptions of AI integration in classroom practices. Their imminent transition into the teaching profession provides valuable insights into how AI is perceived by those who will soon apply it in real educational settings.

Data collection instrument: Adapted TAM-based survey

This study is grounded in the Technology Acceptance Model (TAM), which serves as the theoretical framework for examining Omani pre-service teachers' preparedness and perceptions of AI in educational settings. Originally proposed by Davis (1989) and derived from the Theory of Reasoned Action (Fishbein & Ajzen, 1977), TAM is widely recognized in information technology (IT) research for explaining how individuals accept and adopt new technologies. The model posits that the behavioral intention to use a technology—ultimately leading to its actual adoption—is influenced by two key factors:

- **Perceived Usefulness (PU):** The extent to which an individual believes that using a particular technology will enhance their performance or help them achieve their goals. In other words, does AI in education provide tangible benefits that improve teaching and learning?
- **Perceived Ease of Use (PEU):** The degree to which an individual perceives a technology as easy to learn and use. This aspect addresses whether AI tools in the classroom require significant effort to adopt or can be seamlessly integrated into teaching practices.

According to TAM, when individuals perceive a technology as both useful and easy to use, they are more likely to develop a positive intention toward its adoption, which subsequently increases actual usage. This framework is particularly relevant to the present study, as it provides a structured perspective for examining pre-service teachers' attitudes, intentions, and perceived challenges related to AI integration in classroom settings.

Validity and reliability of data collection tools

To ensure the validity and reliability of the study, this research employed an adapted and empirically validated TAM-based data collection instrument. The primary instrument is a five-point Likert scale survey designed to assess respondents' intensity of agreement or disagreement with various aspects of AI integration in education. The survey covered key dimensions, including:

1. Attitudes toward AI in teaching and learning
2. Awareness of AI's capabilities and limitations

3. Perceptions of AI's role in education
4. Intentions to adopt AI in future teaching practices
5. Preparedness and training adequacy for AI integration
6. Challenges associated with AI implementation
7. Institutional support and available resources

To enhance the depth and flexibility of responses, each section of the survey was followed by an open-ended question, allowing participants to express their perspectives beyond the constraints of the Likert scale format. These qualitative responses provide critical insights that complement the numerical data, enabling a more comprehensive analysis of the factors influencing AI adoption in Omani teacher training programs.

All necessary ethics approvals were obtained before the commencement of the pilot study to ensure compliance with research ethics and participant protection protocols. The pilot study served as a preliminary phase to refine the survey instrument, ensuring its face validity, clarity, and reliability before full-scale data collection. A group of Practicum 2 students was selected to participate in this phase, providing a relevant sample closely matching the study's target population. Feedback from the pilot participants was carefully analyzed, leading to minor modifications that improved the wording, structure, and overall comprehensibility of the questionnaire. This step was essential for enhancing the credibility of the survey results and reinforcing the methodological rigor of the study.

To assess the validity and reliability of the survey, JASP, a statistical software for data analysis, was used. A unidimensional reliability analysis was conducted, revealing a Cronbach's alpha of 0.785. This value falls within the acceptable range for social science research, indicating good internal consistency among the survey items. In other words, the survey items cohesively measured the intended constructs—Pre-service Teachers' Preparedness and Perceptions of AI Integration in Classroom Practices—with a high degree of reliability across different items. This confirms that the survey is a valid and dependable instrument for further research in the field of AI integration in education, as shown in Table 1.

Table 1
Frequentist scale reliability statistics

Estimate	Cronbach's α
Point estimate	0.829
95% CI lower bound	0.793
95% CI upper bound	0.860

Note. Of the observations, pairwise complete cases were used. The following items correlated negatively with the scale: Q30 and Q31.

Additionally, to mitigate potential response bias and enhance the rigor of the assessment, three survey questions were intentionally reversed. This technique helps ensure that respondents engage thoughtfully with the questions rather than providing patterned or biased responses, ultimately leading to more accurate and meaningful data. By implementing this pilot testing and statistical validation process, the study reinforces the credibility and robustness of its methodology, thereby laying a strong foundation for the subsequent full-scale investigation.

For the main data collection phase, the survey was administered electronically using Microsoft Forms, a platform chosen for its accessibility, user-friendliness, and built-in analytical tools that facilitated initial data processing. To maximize participant reach, official communication channels were utilized to access the student population across multiple HEIs in Oman.

Data analysis

The data collected from the survey were subjected to comprehensive analysis using both quantitative and qualitative methods to address the research questions regarding pre-service teachers' preparedness and perceptions of AI integration in classroom practices.

For the quantitative data, the analysis primarily involved t-tests, along with descriptive and frequency tables to summarize and interpret the responses. This statistical approach provided insights into the central tendencies and distribution of the data, helping to identify key trends and relationships among variables. Certain survey questions (Q12, Q22, Q30, Q31, and Q32) were reverse-coded due to their negative phrasing, ensuring consistency in the interpretation and analysis of responses. Additionally, to investigate the relationships among the TAM variables—including general attitudes toward technology, awareness of AI, perceived usefulness, perceived ease of use, intention to use AI, access to training, challenges and concerns, and support and resources—a Pearson product–moment correlation analysis was conducted.

During the data cleaning process, six entries were removed due to zero responses, reducing the dataset to a total of 210 valid responses. Although the final sample size may appear modest, it is considered statistically robust for quantitative social science research. This adequacy is supported by established power analysis guidelines, specifically Cohen's (1992) recommendation that approximately 30 participants per group are sufficient to detect a medium effect size with a statistical power of 0.80 in parametric tests such as the t-test and ANOVA. Furthermore, some respondents left certain questions unanswered; however, since JASP excludes missing values from calculations, only complete responses were included in the analysis. For clarity and consistency, variables were abbreviated and renamed to correspond with the original survey questions.

Only the gender variable and the Likert scale variables were included in the final statistical analysis, as they were central to addressing the research questions. This focused approach ensured that the statistical results were relevant and aligned with the study's objectives.

For the qualitative data, responses to the open-ended questions were analyzed using thematic analysis, through which key themes and patterns were identified and categorized. This qualitative analysis complemented the quantitative findings by providing deeper insights into participants' attitudes and experiences regarding AI integration in education. In summary, the study utilized a mixed-methods approach, integrating both statistical analyses and thematic interpretation to provide a comprehensive understanding of the subject.

Results

TAM, which aims to explore individuals' acceptance and use of new technologies, was implemented in the survey. It surveyed pre-service teachers' general attitudes toward technology; their awareness and knowledge of AI; the PU of AI in education; and their intention to use AI in teaching. The results indicated that these content areas, along with others, were related to challenges, concerns, support, and resources. Each content item was depicted statistically, accompanied by quotations from respondents when applicable.

Table 2

Descriptive statistics of content items related to the TAM

Content items	Gender	Valid	Mean	Std. Deviation
General Attitude toward Technology	Female	99	**3.530**	0.81
Awareness of Knowledge of AI	Male	108	**3.130**	0.66
Awareness of Knowledge of AI	Female	99	**3.155**	0.56
Perceived Usefulness of AI in Education	Male	110	**3.888**	0.66
Perceived Usefulness of AI in Education	Female	99	**3.853**	0.69
Perceived Ease of Use of AI in Education	Male	107	**3.305**	0.57
Perceived Ease of Use of AI in Education	Female	96	**3.288**	0.49
Intention to use AI in Teaching	Male	107	**3.858**	0.91
Intention to use AI in Teaching	Female	97	**4.017**	0.71
Challenges and Concerns	Male	106	**3.170**	1.00
Challenges and Concerns	Female	96	**3.274**	0.82
Support and Resources	Male	105	**2.652**	0.94
Support and Resources	Female	92	**2.967**	0.86

[a] *The mode is computed assuming that variables are discrete.*

General Attitudes Toward Technology: As shown in Table 2, male and female pre-service teachers across the Sultanate generally exhibited a positive attitude toward technology, with a significant majority (48%) feeling comfortable using new technologies in their personal lives, as indicated in Table 3.

Table 3

I feel comfortable using new technologies in my personal life

	Frequency	Percent	Valid Percent	Cumulative Percent
Not at all	3	1.435	1.435	1.435
Rarely	8	3.828	3.828	5.263
Sometimes	45	21.531	21.531	26.794
Often	100	47.847	47.847	74.641
Always	53	25.359	25.359	100.000

Additionally, 41% of the participants were among the first to try new technologies in their teaching. They mentioned several technologies they have integrated, including interactive games and platforms such as Kahoot, Quizlet, and Wardwall; presentation and design tools such as Canva, Prezi, Camma, and Slidego; hardware integration such as projectors, smartboards, iPads; and specialized educational tools like GeoGebra, which is frequently used for teaching mathematics. However, some respondents explicitly indicated that they have not used any technology or are in the early stages of adoption. This discrepancy highlights an important distinction between being comfortable using technology in personal life and taking a proactive approach to exploring and utilizing new tools in teaching.

Awareness and Knowledge of AI: The results presented in Table 1 indicate that respondents' awareness of AI was moderate. Moreover, 71% of participants reported being either moderately or very familiar with the concept of AI, and a similar proportion (67%) expressed a high level of awareness regarding how AI can be applied to enhance teaching and learning processes. These findings suggest that, while a significant number of respondents recognize AI's potential in education, there remains room to improve overall familiarity and knowledge. Although 49% of participants do not perceive AI as overly challenging, a small percentage (14%) felt that AI is too complex to understand. This diversity of perspectives among pre-service teachers could be addressed by providing simplified training sessions to demystify the concept of AI.

Table 4
AI technologies are too complex for me to understand

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly agree	9	4.306	4.348	4.348
Agree	21	10.048	10.145	14.493
Neutral	75	35.885	36.232	50.725
disagree	82	39.234	39.614	90.338
Strongly disagree	20	9.569	9.662	100.000

Perceived Usefulness of AI in Education: The survey revealed that the majority of participants viewed AI as a useful and valuable tool in educational contexts. Specifically, 76% of respondents believe that AI can substantially improve students' learning experiences during microteaching sessions or school practicums. Similarly, 76% agree that integrating AI into teaching practices

would enhance their overall effectiveness as prospective teachers, demonstrating a strong belief in AI's ability to support instructional goals. Furthermore, 68% of respondents recognize AI's potential to personalize learning for individual students, a key benefit in today's diverse educational environments where tailored learning experiences are increasingly important. Moreover, 73% appreciate AI tools for their ability to provide valuable feedback to both teachers and students. Another compelling finding is that 78% of respondents (as shown in Table 5) view AI as a tool that can streamline administrative tasks, thereby freeing up teachers' time to focus more on direct student engagement and instruction.

Table 5
AI can streamline administrative tasks, allowing teachers to dedicate more time to direct student engagement and instruction

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	5	2.392	2.404	2.404
Disagree	6	2.871	2.885	5.288
Neutral	33	15.789	15.865	21.154
Agree	120	57.416	57.692	78.846
Strongly agree	44	21.053	21.154	100.000

Perceived Ease of Use of AI in Education: The survey indicates a strong sense of confidence among pre-service teachers regarding their ability to adopt and integrate AI tools into their teaching practices. Specifically, 67% of respondents believe they can easily learn how to incorporate AI into their classrooms. Additionally, 60% find AI tools user-friendly, indicating comfort with using these technologies. Despite these positive perceptions, 21% of respondents reported feeling overwhelmed by the idea of using AI in the classroom, as depicted in Table 6. This suggests that while the majority of pre-service teachers are confident about adopting AI, a significant portion still feels uncertain or anxious about the integration process.

Table 6
I feel overwhelmed by the thought of using AI in the classroom

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly agree	**7**	**3.349**	**3.448**	**3.448**
agree	**36**	**17.225**	**17.734**	**21.182**
Neutral	44	21.053	21.675	42.857

disagree	81	38.756	39.901	82.759
Strongly disagree	35	16.746	17.241	100.000

Intention to Use AI in Teaching: The survey results demonstrated a strong and compelling intention among respondents to integrate AI into their teaching practices, reflecting a high level of enthusiasm and readiness for its adoption. Specifically, 78% of participants expressed plans to incorporate AI tools into their future educational work. Furthermore, 78% of respondents reported being motivated to expand their understanding of AI applications in education, highlighting a desire to harness AI's potential to improve teaching and learning outcomes. Additionally, 76% of respondents, as shown in Table 7, indicated they would recommend AI tools to their colleagues, recognizing the benefits of AI not only for their own practices but also for their peers.

Table 7
I would recommend the use of AI in education to my colleagues

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	5	2.392	2.463	2.463
Disagree	9	4.306	4.433	6.897
Neutral	35	16.746	17.241	24.138
Agree	**107**	**51.196**	**52.709**	**76.847**
Strongly agree	**47**	**22.488**	**23.153**	**100.000**

Challenges and Concerns: While most respondents hold a positive view of AI integration in education, several challenges and concerns regarding its implementation persist. Statistically, 42% of respondents expressed reservations about excessive reliance on AI tools in classrooms, and 49% raised concerns about the ethical implications of using AI in education. Interestingly, 35% of respondents believe that AI could compromise the role of the teacher. These concerns emerged from the analysis of open-ended questions. Qualitative analysis further reveals that these obstacles can be categorized into technical, knowledge-based, ethical, temporal, and cultural challenges, all of which are interconnected and influence the efficacy of AI usage in education.

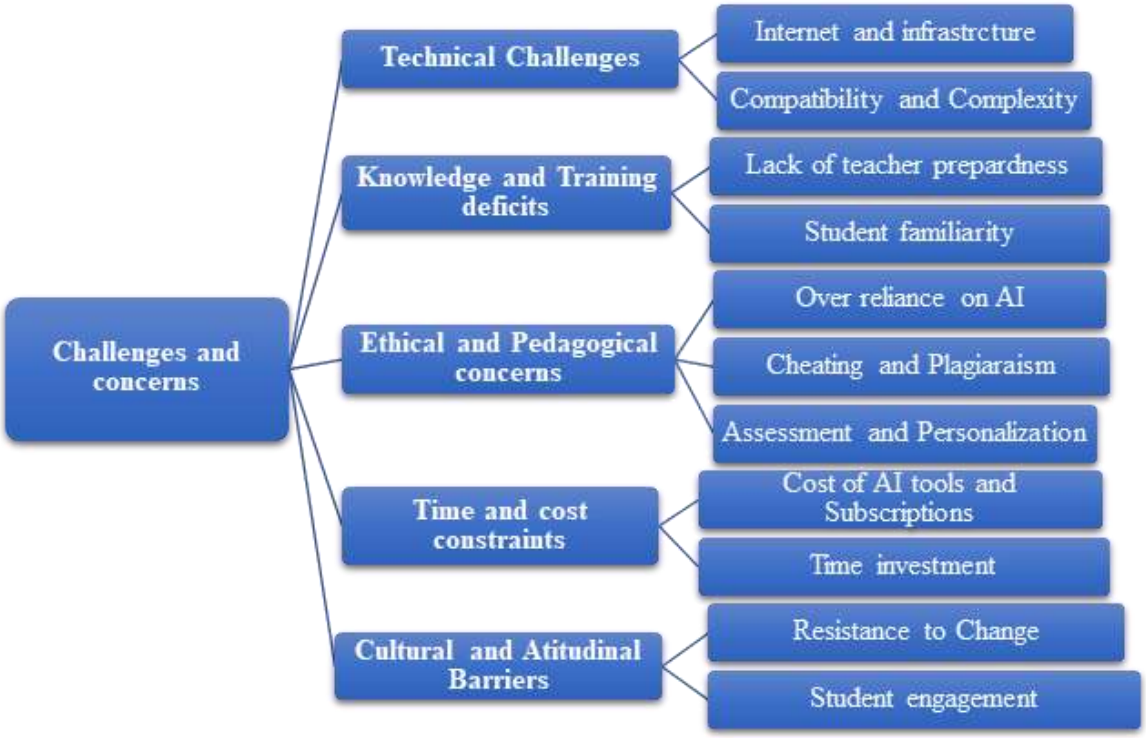

Figure 1: Challenges and concerns of using AI in teaching

Technical challenges, such as poor network quality and the lack of advanced digital devices (e.g., screens, projectors, or updated computers), pose significant obstacles, particularly in rural or underserved schools, as identified by the respondents. Participants also highlighted the complexity and compatibility issues of certain AI tools with existing curricula, which may require additional effort to ensure usability for both teachers and students.

Knowledge and training deficits, as identified by the respondents, underscore the lack of preparedness among teachers. Many teachers lack sufficient knowledge, technical skills, and confidence to integrate AI tools effectively into their teaching. The responses emphasize the need for comprehensive workshops and hands-on training programs to equip teachers with emerging technologies. Similarly, students' familiarity with AI remains uneven, raising concerns about their ability to use AI tools responsibly and effectively without over-reliance or misuse.

Ethical and pedagogical concerns further complicate AI adoption. A major apprehension expressed by participants is the potential over-reliance on AI, which could undermine critical thinking and personal effort. Additionally, concerns were raised about AI's role in facilitating plagiarism and cheating, necessitating the implementation of ethical guidelines and monitoring

mechanisms. Participants also highlighted the limitations of AI in subjective assessments, such as essay grading and adapting to individual learning needs.

Time and cost constraints also emerge as critical barriers. Many respondents highlighted the financial burden of acquiring and maintaining AI tools, compounded by the high subscription fees of effective applications and restricted access, particularly in budget-limited institutions. Participants also expressed concern about the significant time investment required to learn and integrate AI tools into their lesson plans.

Cultural and attitudinal barriers, as highlighted by participants, reflect resistance to change, particularly among older teachers or those unfamiliar with AI. Many respondents identified difficulties in maintaining student engagement and preventing distractions during AI-integrated lessons.

Support and Resources: A statistically significant difference was observed between male and female pre-service teachers regarding their perceptions of support and resources ($t = -2.432$, $p = 0.016$). Descriptive statistics showed that female participants reported higher mean scores ($M = 2.967$, $SD = 0.861$) compared to males ($M = 2.652$, $SD = 0.946$). Although this difference suggests that females perceived the available support and resources somewhat more favorably, both mean scores fall below the midpoint of the 5-point scale ($M < 3$). This indicates that, overall, both groups viewed the level of support and resources as low, with females expressing slightly less negative perceptions than males. The independent samples t-test confirms a statistically significant difference between genders ($p = 0.016 < 0.05$), suggesting that male and female pre-service teachers differ in their experiences or perceptions of available support. However, this finding should be interpreted cautiously, as the difference reflects relative perceptions rather than a genuinely positive evaluation of support and resources.

Table 8
Independent samples t-Test

Independent Samples T-Test	T	df	p
General attitude toward technology	0.054	207	0.957
Awareness and Knowledge of AI	-0.293	205	0.770
Perceived usefulness of AI in Education	0.375	207	0.708

Perceived Ease of Use of AI in Education	0.225	201	0.822
Intention to Use AI in Teaching	-1.378	202	0.170[a]
Challenges and Concerns	-0.802	200	0.424
Support and Resources	**-2.432**	**195**	**0.016**

The survey reveals that 43**%** of respondents believe their institutions do not provide adequate support for integrating AI into teaching. Moreover, **32%** reported a lack of essential tools and technological resources needed for the successful integration of AI into their teaching practices. Qualitative analysis of responses regarding the types of support needed to overcome these challenges reveals several key aspects: training and knowledge development; financial and material support; technical and infrastructural support; pedagogical integration and innovation; and organizational and administrative support.

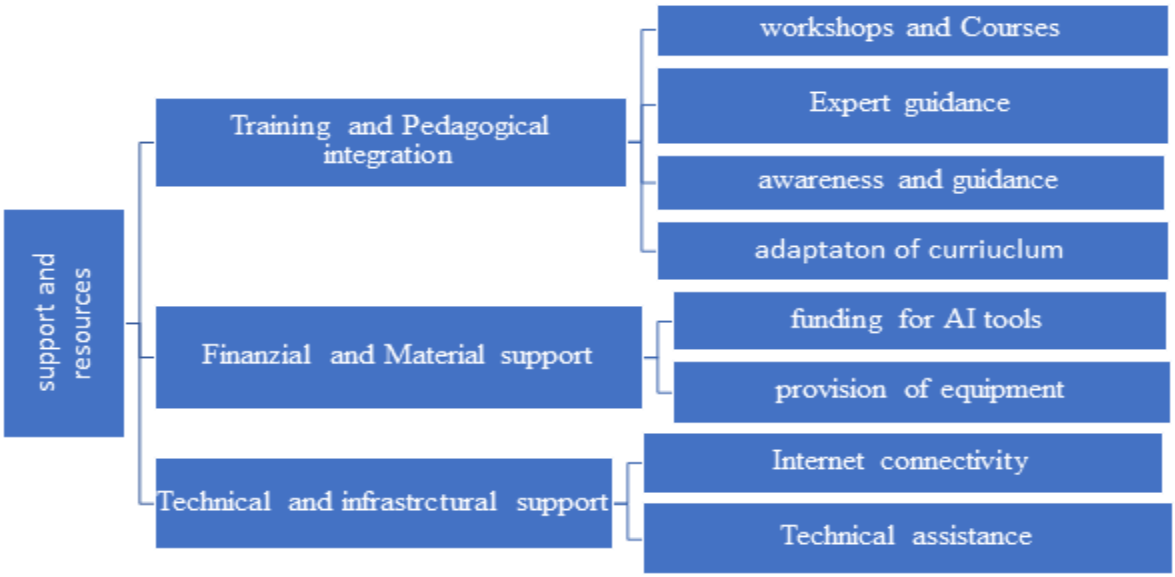

Figure 2: Support and resources for the effective use of AI in educational contexts

Training and Pedagogical Integration: As mentioned in the discussion of knowledge and training gaps, the majority of respondents emphasized the importance of workshops, seminars, and training programs to educate both teachers and students on AI tools, particularly focusing on practical applications and strategies for classroom integration. Participants requested workshops featuring strategies and interactive activities designed to make lessons more effective and

engaging. They also emphasized the value of collaboration with AI experts to provide hands-on practice and mentoring, facilitating the effective incorporation of AI into their classrooms. This aligns with calls for awareness campaigns aimed at demystifying AI tools and providing guidance for their safe and effective use. Furthermore, respondents highlighted the need to align AI tools with curricula and teaching strategies, as well as to develop AI resources tailored to specific subjects and educational goals.

Financial and Material Support: Many respondents emphasized the need for financial assistance to access advanced AI tools, devices, and software. They also advocated for equipping schools with modern digital devices, such as screens, projectors, and reliable internet access.

Technical and Infrastructural Support: The lack of strong, reliable internet connections in schools emerged as a recurring challenge. Respondents suggested collaborating with telecom companies to enhance internet speed and availability, enabling pre-service teachers to fully harness AI's potential to improve teaching and learning outcomes. Additionally, they called for IT support to address technical issues and ensure the smooth operation of AI tools.

Relationship Between the Variables of TAM: The analysis revealed several statistically significant relationships among the variables. The correlation coefficients (r) and p-values are presented in Table 9. According to common conventions, correlation strengths are interpreted as small (r = .10 to .29), medium (r = .30 to .49), and large (r = .50 to 1.0).

Table 9

Pearson correlation matrix for composite variables

Variable	1	2	3	4	5	6	7	8
1. General attitude toward technology	—							
2. Awareness of AI	.224**	—						
3. Perceived usefulness	.355***	.375***	—					
4. Perceived ease of use	.151*	.269***	.283***	—				
5. Intention to use AI	.376***	.359***	.613***	.220**	—			
6. Access to training	.266***	.488***	.350***	.290***	.493***	—		
7. Challenges and concerns	−.203**	.121	.080	.226**	−.054	.002	—	
8. Support and resources	−.031	.145*	.056	.210**	.099	.289***	.160*	—

*Note. *p < .05 (), **p < .01 (), ***p < .001 ().*

The strongest correlation was a large, positive relationship between *PU* and *Intention to Use AI* ($r = .613, p < .001$), indicating that the more useful pre-service teachers perceive AI to be, the stronger their intention to use it. *Intention* also showed moderate correlations with *Training and*

Professional Development ($r = .493$, $p < .001$), *General Attitude Toward Technology* ($r = .376$, $p < .001$), and *Awareness and Knowledge of AI* ($r = .359$, $p < .001$). No significant relationships were observed with *Challenges and Concerns* or *Support and Resources*. This analysis highlights *PU* as the most influential factor associated with pre-service teachers' *Intention to Use AI*. Positive general attitudes, access to training, and AI knowledge also reinforce one another, forming a coherent framework that supports AI adoption in educational contexts.

Discussion

This study aimed to examine the attitudes and readiness of Omani pre-service teachers toward implementing AI in the classroom. It sought to achieve four objectives: assessing the extent of pre-service teachers' readiness to integrate AI into their teaching; exploring their perceptions and attitudes regarding AI integration; identifying the challenges they face when integrating AI; and determining the support they need to facilitate AI integration in teaching. The study also sought to ensure that teacher education programs adequately prepare future teachers with the necessary technological competencies. These objectives will be discussed in light of the findings and the literature reviewed. The discussion will underscore recommendations to enhance and align Omani teacher education programs with the international trend of integrating AI into educational curricula.

1. **To what extent are pre-service teachers prepared to integrate AI into their teaching?**

The findings of the study indicate that pre-service teachers in the Sultanate of Oman are prepared to integrate AI into their teaching. Their readiness stems from their openness to and comfort with using new technologies in their personal lives. This finding aligns with the study by Park and Son (2022). This is unsurprising, given that technological tools and applications are currently available and easily accessible for individuals to explore in the current technological era.

Moreover, their readiness to integrate AI into their teaching is based on their technological pedagogical knowledge and awareness of AI concepts. The findings reveal satisfactory levels of awareness and familiarity with the integration of technology in teaching and learning practices, resonating with a study conducted by Chung and Jeong (2024). Pre-service teachers also recognize the potential of AI to enhance the teaching and learning process, a finding that aligns with the recent study by Bautista et al. (2024). However, a small percentage of pre-service teachers perceive AI as complex and convoluted. This apprehension and limited awareness of AI require urgent

attention from teacher education programs, which should provide training sessions to demystify AI concepts and better prepare pre-service teachers, as this is a critical competence they need to develop.

Consistent with Bautista et al. (2024), pre-service teachers possess not only technological pedagogical knowledge but also technological knowledge. The findings indicate a satisfactory level of readiness among pre-service teachers to adopt and integrate AI tools into their teaching practices. A high percentage described AI tools as "user-friendly" and expressed comfort in using technological tools without encountering significant technical issues. However, a small percentage of pre-service teachers feel overwhelmed by the idea of using AI in classrooms. Consequently, they still lack adequate knowledge on how to effectively integrate appropriate technological tools into their lessons. This is unsurprising, as the aforementioned study found that pre-service teachers perceive knowledge of content, pedagogy, and technology as separate entities. For effective technology integration, these entities should be considered as a cohesive whole. This further highlights the need for support from teacher education programs through workshops and training sessions to bridge the gap between pre-service teachers' technological knowledge and pedagogical skills, enabling them to effectively utilize appropriate technological tools in their teaching.

A final note regarding the readiness of pre-service teachers to integrate AI into their teaching is their compelling motivation to adopt AI tools upon graduation. A significant percentage of pre-service teachers, as shown in the findings and supported by Thararattanasuwan and Prachagool (2024), not only express a keen willingness to incorporate AI tools into their teaching but also intend to recommend these tools to their peers, reflecting a shared responsibility to harness AI's potential for technological innovation in the Sultanate of Oman.

2. **What are pre-service teachers' perceptions of integrating AI into their teaching?**

Pre-service teachers generally exhibit a positive attitude toward integrating AI into their teaching practices, recognizing its potential to enhance educational experiences. They believe that AI can significantly improve student engagement during microteaching sessions or school practicums, demonstrating its value in practical, hands-on teaching environments. This perspective aligns with the findings of Chung and Jeong (2024), which indicate that AI tools, such as ChatGPT, effectively support instructional efficiency and feedback delivery. Furthermore, respondents highlight AI's capacity to personalize learning—an increasingly critical feature for addressing diverse student

needs. Studies underscore how AI's adaptability can cater to individual learning styles, fostering inclusivity and improved outcomes, as noted by Altinay et al. (2024) and Bae et al. (2024).

Another key perception is AI's role in providing timely, actionable feedback, a feature that can enhance both teaching and learning processes. Additionally, pre-service teachers appreciate AI's ability to streamline administrative tasks, reducing their workloads and allowing for greater focus on direct student interaction. This reflects broader findings that pre-service teachers value AI for simplifying logistics, thereby enhancing their teaching effectiveness, as supported by studies such as Karataş and Yüce (2024) and Zaugg (2024). These findings highlight the importance of embedding AI in curricula, given its potential to enhance the teaching and learning experience.

3. **What challenges do pre-service teachers encounter when integrating AI into their teaching?**

Despite their positive perceptions, pre-service teachers face several challenges and concerns when integrating AI into their teaching. As highlighted in the results, these challenges include technical issues, knowledge gaps, ethical considerations, time constraints, and cultural factors. These challenges are corroborated by multiple studies (Bae et al., 2024; Bautista et al., 2024; Chung & Jeong, 2024; Zaugg, 2024). For instance, infrastructure and accessibility barriers, particularly in underserved regions, are also reported by some teachers in the Philippines, as noted by Bautista et al. (2024). Additionally, a lack of knowledge and technical skills compounds these concerns, aligning with the experiences of South Korean teachers described by Bae et al. (2024), who feel unprepared and lack sufficient content knowledge related to AI concepts, potentially leading to reluctance in effectively implementing AI tools in classrooms.

Ethical concerns—such as overreliance on AI, cheating, and the limitations of AI in subjective assessments—add another layer of complexity, echoing the concerns of Chinese pre-service teachers (Chung & Jeong, 2024). Similar to their Omani counterparts, Chinese pre-service teachers worry that overreliance on AI tools could lead to a decline in students' critical thinking skills and creativity. However, unlike Omani pre-service teachers, Chinese pre-service teachers believe that AI can save time in lesson planning and homework. Lastly, resistance to change is viewed as a cultural challenge, contrasting with Turkish teachers, who perceive AI as a tool that cannot replace teachers but rather makes their jobs easier (Erol & Erol, 2024).

Addressing these challenges requires targeted professional development focused on ethical AI use and technical proficiency. Offering training that combines technological expertise with critical

thinking can mitigate pre-service teachers' concerns and enhance their confidence in using AI tools responsibly. Furthermore, these findings underscore the importance of embedding AI literacy and support structures into teacher education programs to equip future pre-service teachers for intelligent digital classrooms while maintaining ethical and pedagogical standards.

4. **What support do pre-service teachers need to effectively integrate AI into their teaching?**

The adoption of AI in education faces significant barriers due to a lack of institutional support and resources. The findings indicate that a notable number of male participants believe their institutions do not provide adequate support for integrating AI into teaching, whereas female participants tend to perceive the available support and resources more positively. This contrast underscores broader perceptions of institutional unpreparedness and suggests possible gender-based differences in experiences or expectations regarding AI integration. These findings on institutional support align with research indicating that institutional readiness—encompassing professional development, financial backing, and managerial support—is critical for successful AI adoption (El Essawi, 2024). Furthermore, 32% of respondents reported insufficient access to necessary hardware and software resources, a finding consistent with El Essawi's study, which emphasizes resource availability as a key determinant of AI integration.

The absence of institutional support often translates into frustration among pre-service teachers and limits their ability to effectively incorporate AI into their teaching practices. Moreover, the lack of clear policies and training exacerbates these challenges, leaving pre-service teachers uncertain about how to use AI tools responsibly and efficiently. Therefore, institutions must invest in comprehensive infrastructure, including updated hardware, user-friendly software, and accessible technical support. Additionally, fostering a culture of institutional readiness through training, clear guidelines, and collaborative policymaking can bridge the gap between motivation and practical implementation. Strategic investments and support mechanisms are essential to empower pre-service teachers, enabling them to unlock AI's potential to enhance teaching and learning outcomes.

Implications

The discussions highlight several theoretical and practical implications for the successful adoption and integration of AI in education. TAM serves as a comprehensive framework for explaining the acceptance and adoption of new technologies, such as AI. Findings from the survey on pre-service teachers' acceptance of AI in education primarily extend the TAM while supporting its core tenets. The strong positive perceptions of AI's perceived usefulness and the high intention to use it directly validate the fundamental TAM relationship between these constructs. However, the study's strength lies in identifying critical external variables that mediate this acceptance, thereby extending the model. Specifically, the significant roles of challenges and concerns, along with the low perception of support and resources, suggest that factors such as ethics and trust are crucial for actual adoption. Based on this, there is a call for educators and institutional stakeholders to provide technical, pedagogical, and ethical support to mitigate the challenges that pre-service teachers currently face, which might inhibit the effective integration of AI in Omani classroom settings. By successfully incorporating AI in higher education, both students' learning experiences and teachers' instructional methods can be enhanced, aligning with international higher education standards.

Conclusion and Recommendations

This study explored Omani pre-service teachers' preparedness for and perceptions of integrating AI into classroom practices. The findings reveal a generally high level of enthusiasm and openness among participants, with many expressing positive attitudes toward the educational potential of AI tools. Respondents recognized AI's role in enhancing engagement, streamlining administrative tasks, and personalizing learning experiences. However, the study also identified important concerns, particularly regarding overreliance on AI, ethical challenges such as academic dishonesty, and the limitations of AI in tasks requiring critical thinking and subjective judgment.

These findings underscore the urgent need to foster comprehensive AI literacy among pre-service teachers, equipping them with the technical, pedagogical, and ethical competencies necessary to use AI tools critically and responsibly. While the positive outlook on AI is encouraging, it must be supported by robust institutional frameworks, including clear academic policies, targeted professional development, and curriculum alignment. Such measures are essential to ensure the

effective, ethical, and sustainable integration of AI in teacher education and future classroom practices.

This study highlights the promising readiness and positive perceptions of Omani pre-service teachers regarding the integration of AI into their teaching practices. However, to fully realize this potential, the following actions are recommended:

1. **Curriculum Alignment and Pedagogical Integration**: Systematically integrate AI education into teacher training programs, emphasizing practical classroom applications, ethical considerations, and subject-specific strategies. Focus on developing Technological Pedagogical Content Knowledge (TPACK) to help future teachers effectively combine AI tools with pedagogy and content.
2. **Targeted Training and Professional Development**: Provide regular, hands-on training workshops led by AI experts to demystify AI concepts, build technical skills, and enhance confidence in classroom integration. Special attention should be placed on supporting individuals who feel overwhelmed by AI.
3. **Institutional Support and Infrastructure**: Invest in institutional infrastructure by ensuring access to reliable internet, updated hardware, and essential AI software tools. Institutions should establish clear policies and offer ongoing technical and pedagogical support to reduce uncertainty and frustration among pre-service teachers.
4. **Ethical and Cultural Preparedness**: Embed AI ethics into teacher training programs to address concerns such as overreliance, academic dishonesty, and AI's limitations in subjective assessments. Encourage a culture that views AI as a supportive tool rather than a replacement for educators.
5. **Strategic Investment and Policy Development**: Promote institutional readiness through financial support, stakeholder collaboration, and the development of national strategies aligned with global trends. These initiatives will bridge the gap between pre-service teachers' enthusiasm and their ability to effectively implement AI in real-world classrooms. By addressing these areas, Omani teacher education programs can better equip future teachers with the technological competencies necessary for an AI-enhanced educational landscape.

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