Trainee Teachers and AI: AI Integration During Practicum

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ABSTRACT

The integration of artificial intelligence (AI) in education is transforming the way teachers and students engage with language learning. For pre-service teachers, particularly those undergoing practicum, readiness to use AI is critical in aligning technological competence with pedagogical practice. This study investigates the perceptions, knowledge, and challenges of 100 trainee teachers regarding AI integration in schools during their practicum. Using a qualitative approach supported by thematic analysis of open-ended survey responses, the study highlights four key themes: knowledge and awareness of AI tools, attitudes towards AI in classroom settings, ethical concerns, and infrastructural barriers. Findings indicate that while trainee teachers are generally familiar with AI applications such as grammar checkers, generative chatbots, and automated feedback systems, many lack systematic pedagogical strategies to embed them into lessons. Ethical concerns, including plagiarism and student dependency, further complicate adoption, while limited access to infrastructure in some practicum schools poses practical challenges. The study underscores the need for curriculum reforms that embed AI literacy, ethics, and classroom application strategies into teacher education programs. By addressing these gaps, institutions can better prepare future educators for AI-integrated classrooms. The results provide insights for policymakers, teacher educators, and institutions seeking to align teacher training programs with technological advancements in education.

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Keywords—AI in school, Trainee Teachers, Teacher Education, Practicum, Educational Technology

INTRODUCTION

Artificial intelligence (AI) is rapidly reshaping the landscape of education, influencing how teachers design lessons, assess student work, and facilitate classroom interaction. In recent years, AI-powered platforms have moved from being experimental technologies to becoming integral parts of educational ecosystems. Adaptive learning systems, intelligent tutoring platforms, and generative AI tools now provide teachers and students with new ways to access knowledge, receive feedback, and personalize learning pathways. For language learning, these developments are particularly significant, as AI tools offer immediate corrective feedback, interactive conversational practice, and resources that can be tailored to learners' linguistic needs.

Within the field of English Language Teaching (ELT), AI technologies are increasingly positioned as both teaching aids and learner support systems. Grammar checkers, automated essay scoring systems, and AI-driven chatbots are among the most widely adopted applications. Such tools not only reduce teachers' administrative workload but also allow learners to engage in independent practice outside of classroom hours. Nevertheless, these affordances raise questions about the readiness of trainee teachers to use AI strategically, particularly in contexts where pedagogical goals, ethical considerations, and institutional policies must be balanced.

In Malaysia, the Ministry of Education has emphasized the importance of digital literacy and 21st-century competencies for both teachers and students. As part of this national agenda, all teacher education institutions are tasked with equipping pre-service teachers with the knowledge, skills, and dispositions required to navigate technological change. The Bachelor of Education program at UiTM emphasizes both linguistic proficiency and pedagogical competence, but the integration of AI during teaching practicum remains relatively underexplored.

The practicum represents a critical stage in teacher preparation, as trainee teachers must translate theoretical knowledge into classroom practice while negotiating real-world constraints such as limited resources, diverse student needs, and institutional expectations.

While research on AI in education has grown substantially in recent years, much of the literature focuses on in-service teachers or general teacher education contexts. Studies [1], [10] suggest that trainee teachers often recognize the potential of AI but feel uncertain about its classroom application, citing challenges related to reliability, student misuse, and ethical dilemmas. Yet little is known about how these perceptions play out during practicum, where pre-service teachers face the dual pressures of demonstrating competence and adapting to school environments that may or may not support AI use.

Understanding trainee teachers' readiness to integrate AI during practicum is, therefore, both timely and necessary. Their experiences can provide insights not only into the current state of trainee teacher preparedness but also into broader institutional readiness for AI integration in schools. By examining the knowledge, attitudes, ethical awareness, and perceived challenges of UiTM trainee teachers, this study contributes to ongoing discussions on how teacher education programs can be adapted to better prepare future educators.

Specifically, this paper investigates the extent to which trainee teachers at UiTM are prepared to use AI tools during their practicum. The study addresses four key research questions: (1) What is the level of trainee teachers' knowledge and awareness of AI tools in language teaching? (2) What are their perceptions and attitudes toward integrating AI during practicum? (3) What ethical, pedagogical, and infrastructural challenges do they anticipate? and (4) How can UiTM's teacher education curriculum be improved to support AI integration? By answering these questions, the study seeks to inform curriculum development, institutional strategies, and national policy on AI in teacher education.

LITERATURE REVIEW

AI in Education and Language Learning

Artificial intelligence (AI) has become increasingly embedded in educational practice, particularly in language learning contexts. AI tools can provide adaptive learning pathways, instant feedback, and resources tailored to learners' needs. References [11] highlighted AI's potential to enhance personalized learning and support learner autonomy. This was further emphasized by [6] that AI-driven platforms can improve vocabulary acquisition, pronunciation feedback, and automated assessment, offering teachers valuable support in addressing individual learner needs. Similarly, [5] note that generative AI applications, such as chatbots and interactive writing assistants, reduce routine teacher workload and foster learner independence. These affordances position AI as a transformative tool in English language learning. However, their effectiveness depends on teachers' ability to integrate them pedagogically. Without guidance, students may misuse AI as a shortcut rather than as a meaningful learning resource. The literature, therefore, underscores that teacher readiness is crucial to maximizing AI's benefits. [8]

Pre-service Teacher Readiness and Digital Competence

The readiness of pre-service teachers to adopt AI is closely linked to their digital literacy, pedagogical knowledge, and institutional support. Study [6] argue that effective AI integration requires more than technical familiarity; teachers need knowledge that aligns technology with subject content and pedagogy, consistent with the Technological Pedagogical Content Knowledge (TPACK) framework. Many pre-service teachers understand the AI tools conceptually but face challenges applying them meaningfully in classroom settings [1], [10]. In the Malaysian context, trainee teachers are aware of AI tools such as grammar checkers and translation applications, but often lack confidence in deploying them effectively during teaching practice [5]. Concerns include classroom management, reliability of AI outputs, and alignment with learning objectives. Exposure alone does not equate to readiness; structured training and practice are essential for competence and confidence.

Ethical and Pedagogical Concerns

Alongside potential benefits, AI introduces ethical and pedagogical dilemmas. Study [17] cautions that

unchecked AI use raises concerns around academic dishonesty, data privacy, and over-reliance on automated systems. These risks are particularly pressing in school contexts where students may substitute AI outputs for their own work. Trainee teachers require explicit preparation in AI ethics, including understanding biases in AI systems, data protection, and strategies to prevent plagiarism training [8]. Embedding ethics training into teacher education programs is essential to balance innovation with accountability [2].

Empirical Studies on AI in Teacher Training

A growing body of research examines AI's role in teacher education. [1], [10] found Malaysian trainee teachers were familiar with AI tools but hesitant to apply them during practicum due to uncertainty about reliability. Internationally, [6] documented similar challenges, noting pre-service teachers often lack pedagogical strategies to embed AI into lesson design and classroom interaction. Generative AI offers opportunities to automate lesson planning and provide personalized feedback, but its successful use depends heavily on teacher monitoring and critical engagement [7], [14]. Without oversight, students may disengage from learning or misuse AI outputs. Teacher education programs should therefore combine technological training with reflective practices.

The Research Gap

The reviewed studies confirm AI's growing relevance but reveal significant gaps. Few studies focus specifically on the practicum stage, where pre-service teachers must apply theoretical knowledge in real school environments [1], [10]. Most literature examines perceptions in general teacher education contexts rather than high-stakes classroom practice. In Malaysia, limited research addresses how trainee teachers negotiate practical, ethical, and infrastructural challenges of using AI in schools [5], [12]. This study addresses these gaps by investigating UiTM trainee teachers' readiness to integrate AI during practicum. Focusing on live experiences in real classrooms provides insights into how future teachers can be better prepared for AI-integrated education. [3]

METHODOLOGY

Research Design

This study adopted a survey-based mixed-methods design, but relied solely on a structured questionnaire. The questionnaire combined closed-ended items (quantitative) and open-ended questions (qualitative), allowing for both statistical description and thematic exploration of trainee teachers' readiness to integrate AI in schools.

Participants

The study involved 100 trainee teachers from University Technology MARA (UiTM), all of whom were doing their teaching practicum in secondary schools during the 2023/2024 academic year. The participants were selected purposively, as they represented the group most directly engaging with AI integration in real classroom contexts. The sample comprised 74 females and 26 males, reflecting the demographic trend in bachelor's in education programs.

Research Instrument

A self-administered questionnaire was designed based on validated instruments in prior studies [11].The instrument had four parts which were Demographics (gender, age, practicum placement), Knowledge and Awareness of AI Tools (10 items, 5-point Likert scale), Attitudes toward AI Integration (12 items, 5-point Likert scale), Challenges and Ethical Concerns (8 items, 5-point Likert scale) and Open-Ended Questions (3 items) for reflections on opportunities, challenges, and ethical considerations. The questionnaire was piloted with 20 trainee teachers outside the main sample to check clarity and reliability.

Data Collection

The survey was distributed in printed form during the mid-point of the practicum period, ensuring that respondents had classroom experience to reflect on. Participation was voluntary, and all responses were anonymized.

Data Analysis

Data were analyzed through two complementary approaches. The first one was Quantitative Analysis (Descriptive): Likert-scale responses were converted into percentages to summarize trends in knowledge, attitudes, and perceived challenges. For example, the proportion of students who agreed or strongly agreed with statements on AI integration was reported. No inferential tests were used, as the aim was to provide a broad overview. The second one was Qualitative Analysis (Thematic): Responses to the open-ended items were analyzed using thematic analysis [4]. Codes were developed inductively, leading to themes such as the *usefulness of AI in lesson planning*, *concerns about plagiarism*, and *school infrastructure limitations*. Direct excerpts from respondents are reported to illustrate the findings.

Ethical Considerations

Ethical clearance was obtained from the UiTM Faculty of Education Research Ethics Committee. Participants were informed of the study's objectives and their rights. Responses were anonymized and stored securely, with pseudonyms used when citing excerpts.

FINDINGS AND DISCUSSIONS

Thematic analysis of the responses from 100 trainee teachers revealed four dominant themes: (1) Knowledge and Awareness of AI Tools, (2) Perceptions and Attitudes toward AI Integration, (3) Ethical and Pedagogical Concerns, and (4) Infrastructure and Institutional Support. Each theme is presented with descriptive statistics, illustrative excerpts, and interpretation in relation to existing literature.

Theme 1: Knowledge and Awareness of AI Tools

A majority of respondents (98%) indicated familiarity with at least one AI tool relevant to teaching and learning. Tools most frequently mentioned included Grammarly, ChatGPT, Quillbot, Google Translate, and AI-assisted quiz generators such as Quizizz and Kahoot (AI-enhanced). While students were generally confident in using AI for basic tasks, fewer (41%) reported integrating them systematically into lesson plans.

Excerpts from respondents:

"I used Grammarly to help my students check their essays. It

is fast and helps them notice errors, but sometimes the suggestions are too advanced for their level."

"ChatGPT gave me ideas for lesson planning, but I had to modify everything because it didn't always match the curriculum."

"I have heard of AI tools like Quillbot, but I am not sure how to use them properly for classroom teaching."

"I think I know AI tools, but using them in class is different from just using them for my own assignments."

Interpretation:

This finding aligns with [1],[10], who emphasized that while pre-service teachers often display digital familiarity, they lack structured pedagogical training to integrate AI effectively. The gap between awareness and application suggests a need for formalized AI literacy within teacher education curricula.

Theme 2: Perceptions and Attitudes toward AI Integration

Respondents expressed generally positive attitudes toward AI integration. About 81% agreed that AI could enhance teaching effectiveness, especially in reducing routine tasks such as grading and lesson preparation. However, 24% voiced skepticism, citing fears that AI might "replace teachers" or reduce student engagement in

traditional learning.

Excerpts from respondents:

"AI helps me save time on administrative work, so I can focus more on interacting with my students."

"I worry that students will depend too much on AI and stop thinking critically."

"AI can be a partner, not a replacement. It makes me feel more prepared during lessons."

"In rural schools, talking about AI feels unrealistic. We still struggle with Wi-Fi."

Interpretation:

These perspectives mirror findings by [1], [10] who observed ambivalence among Malaysian trainee teachers, balancing optimism with hesitation. Globally, similar tensions were noted [17], highlighting the need for teacher education programs to emphasize the supportive—not substitutive—role of AI.

Theme 3: Ethical and Pedagogical Concerns

Ethical concerns were highlighted by 68% of respondents, with plagiarism, authenticity of student work, and fairness of AI feedback emerging as dominant issues. Several respondents also mentioned the risk of students bypassing learning by over-relying on AI-generated answers.

Excerpts from respondents:

"Students submit essays fully written by ChatGPT. It's hard to know if they learned anything."

"Plagiarism is a big problem because students don't see AI use as cheating."

"I feel guilty myself sometimes because using AI makes the job easier, but it also feels like I'm not fully teaching."

"Bias in AI is worrying. It sometimes gives examples that don't suit Malaysian contexts."

Interpretation:

These findings support [8], who cautioned about the ethical pitfalls of AI adoption in education. Study [17] also stressed the importance of explicit ethics training for teacher trainees. The ethical dilemmas reported by respondents indicate the urgency of incorporating digital ethics and critical AI literacy into UiTM's teacher training modules.

Theme 4: Infrastructure and Institutional Support

A recurring challenge was infrastructure. Approximately 47% of respondents reported limited access to stable internet, especially in rural practicum schools, while 35% cited outdated school devices as barriers. Many highlighted the need for hands-on AI workshops and access to institutional subscriptions.

Excerpts from respondents:

"My school doesn't have enough computers, and the internet is very slow. AI is impossible here."

"We need training, not just exposure. A one-day workshop is not enough to understand AI."

"We should be given licensed access to AI platforms, so we don't rely on free versions with limitations."

"If schools don't support us, AI will remain a theory, not a practice."

Interpretation:

Infrastructure challenges resonate with findings from regional studies such as [17], which emphasized disparities in AI integration due to infrastructural inequities. Institutional strategies must also address both access and capacity-building to ensure equitable AI adoption across practicum placements.

SUMMARY OF FINDINGS

The themes collectively suggest several important patterns in trainee teachers' perceptions and readiness to integrate AI in their teaching practice.

High awareness but limited pedagogical application of AI tools.

Most trainee teachers are familiar with widely available AI applications such as grammar checkers, translation tools, and chatbots. However, this awareness has not yet translated into strong classroom practice. While they recognize the potential of AI to support lesson planning, language exercises, and formative assessment, many reported difficulties in aligning AI use with pedagogical goals. This indicates a gap between conceptual understanding of AI tools and the ability to embed them meaningfully into instructional design.

Positive but cautious attitudes.

The overall sentiment towards AI in education is optimistic. Trainee teachers often described AI as innovative, engaging, and supportive in reducing their workload. At the same time, their enthusiasm was tempered by skepticism, particularly regarding the reliability of AI outputs and the risk of over-reliance. Some teachers expressed concern that an excessive dependence on AI might erode creativity and critical thinking among learners, suggesting that while they value AI's potential, they remain wary of its limitations.

Significant ethical concerns.

A recurring theme was unease about academic honesty and student misuse of AI. Trainee teachers highlighted the ease with which learners might rely on AI-generated work, raising risks of plagiarism and diminished learning responsibility. Concerns were also expressed about data privacy, bias in AI systems, and questions of authenticity in student assignments. This reflects a broader recognition that effective AI integration must be accompanied by clear ethical guidelines and digital citizenship training.

Infrastructure and institutional gaps.

Despite their willingness to experiment with AI, many trainee teachers pointed to systemic barriers that hinder effective integration. These included inconsistent internet access, limited institutional support for training, and a lack of explicit policies on AI use in schools. In some cases, outdated hardware and insufficient digital infrastructure further constrained their ability to explore AI-driven teaching strategies. These findings highlight that readiness is not only a matter of individual competence but also dependent on organizational and structural support. Taken together, the findings suggest that while trainee teachers are aware of and open to using AI in their teaching, their practical readiness is moderated by pedagogical, ethical, and infrastructural challenges. Addressing these issues requires targeted training, institutional investment, and policy frameworks that equip future teachers to use AI responsibly and effectively in real classroom contexts. These findings contribute to the discourse on AI in teacher education, reinforcing global observations [1], [10] while contextualizing challenges specific to Malaysia.

CONCLUSIONS

The findings suggest that while trainee teachers are aware of AI and acknowledge its potential, gaps remain in pedagogical application, ethical literacy, and infrastructural support. Addressing these issues through targeted

curriculum design and policy interventions can better prepare future teachers for AI-integrated classrooms.

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