

# Artificial Intelligence in Accounting Education: A Study on Virtual Tutor Development in Malaysia

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**Abstract:** *The rapid advancement of artificial intelligence (AI) in the digitalisation era presents transformative opportunities for accounting education, particularly in Malaysia, where personalised learning and real-time feedback are critical for student success. This study investigates the development and implementation of AI-powered virtual tutors tailored for Malaysian accounting students, aiming to identify essential features and address adoption challenges. Utilising a qualitative research design, data were collected through semi-structured interviews and focus group discussions with undergraduate accounting students, educators, and AI experts from public and private universities. Thematic analysis revealed key features such as adaptive learning pathways, scaffolded support, real-time feedback, and user-friendly interfaces. However, challenges persist, including technological infrastructure limitations, digital literacy gaps, and notably, the lack of a personal and individual approach in AI tutoring systems. The findings emphasise the importance of designing AI tutors that are both technologically advanced and pedagogically relevant, while also addressing the need for humanised learning experiences. This study contributes valuable insights and policy recommendations for Malaysian higher education institutions, highlighting AI's potential to create more engaging, personalised, and effective accounting education, while underscoring the importance of addressing critical implementation considerations in the digitalisation era.*

**Keywords:** Accounting students<sup>1</sup>, AI in education<sup>2</sup>, Malaysia<sup>3</sup>, qualitative research<sup>4</sup>, virtual tutor<sup>5</sup>

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## 1. INTRODUCTION

With educational ramifications that are becoming more obvious in the digitalisation era, artificial intelligence (AI) is drastically altering how we learn (Holmes et al., 2022). By offering students individualised support and possibly increasing their learning, AI-powered virtual tutors hold great promise for enhancing education (Hwang et al., 2020). This is particularly pertinent in areas where creative solutions are acknowledged to be needed, such as Malaysian accounting education. However, for AI to truly succeed in Malaysian accounting education, we must carefully consider both pedagogical and technological issues, ensuring that these tools are user-friendly, maintain student engagement, and correspond with the curriculum (Zawacki-Richter et al., 2019).

### 1.1 Background of the Study

The digitalisation era has profoundly impacted the education sector, accelerating the shift towards digital learning platforms and the integration of artificial intelligence (AI) in educational settings (Alexandra et al., 2022). This transformation has highlighted both opportunities and challenges in delivering effective learning experiences. Adaptive learning systems that cater to diverse student needs, especially in subjects like accounting which demand both theoretical understanding and practical application, are increasingly necessary (Klemenčič et al., 2022). AI-powered virtual tutors offer a promising solution by providing personalised attention and real-time feedback, essential for grasping complex accounting concepts (Zhang et al., 2021). Malaysia, where there is a growing need for creative educational solutions to meet the demands of the digitalisation era, exemplifies how AI can improve learning (Romero-Carazas et al., 2023).

### 1.2 Problem Statement

The integration of artificial intelligence (AI) in accounting education has gained significant attention in the digitalisation era, which has accelerated the adoption of digital learning platforms (Zhang et al., 2021). However, despite the potential of AI to enhance learning outcomes, there remains a notable lack of

personalised and scalable AI-powered virtual tutors tailored specifically for Malaysian accounting students. This gap is critical, as accounting education requires both theoretical understanding and practical application, often necessitating personalised feedback and real-time interaction (Romero-Carazas et al., 2023).

Furthermore, a major drawback of AI integration is the lack of personal and individual approach in virtual tutoring systems, which may hinder the development of deeper student-teacher relationships and nuanced understanding of learner needs (Ayatulloh et al., 2024). There are also several impediments to the integration of AI in accounting education. Ensuring AI tools support deep learning rather than just automation and align with educational goals is a pedagogical concern (Ayatulloh et al., 2024). Technological issues include the need for students to acquire skills that supplement AI capabilities and the dependability and credibility of AI systems (Ayatulloh et al., 2024). Additionally, the integration of AI in accounting education poses both threats and opportunities, necessitating a critical examination of its implications on the discipline. For instance, AI can enhance student engagement and learning outcomes, but its adoption requires careful consideration of factors such as perceived benefits, attitudes, trust, and satisfaction from AI users (Tandiono, 2023).

This study aims to address these gaps by investigating the development and impact of AI-powered virtual tutors in enhancing accounting education in Malaysia.

### 1.3 Research Objectives

This study aims to address the gap in personalised and scalable AI-powered virtual tutors for Malaysian accounting students by focusing on two primary objectives:

1. To identify the key features of a virtual tutor that would be most effective for Malaysian accounting students, ensuring that these tools align with the specific needs and learning styles of this demographic.
2. To develop a suitable model for AI-based virtual tutors in Malaysian higher education, tailored to enhance accounting education outcomes.

To guide this investigation, two research questions are posed:

1. What are the essential elements of an AI-powered virtual tutor in accounting education? And
2. How can a virtual tutor model be developed to suit the unique needs of Malaysian accounting students?

By exploring these questions, this study aims to contribute to the development of more effective AI-driven educational tools in Malaysia.

### 1.4 Significance of the Study

This study is crucial to the development of AI adoption in Malaysian education, especially when it comes to accounting education. Research on the creation and effects of AI-powered virtual tutors advances our knowledge of how AI can improve individualised learning for Malaysian students (Kavitha, 2023). The study's conclusions will give educators important information that will enable them to create AI-powered learning resources that better meet the various needs of students (Crompton & Burke, 2023). The study has the potential to improve student learning outcomes by utilising AI tools that provide adaptive learning pathways and real-time feedback (Zhang et al., 2021). As a result, learning experiences may become more effective and engaging, preparing students for future interactions (Tandiono, 2023). This research will also be useful to policymakers since it will help them develop strategies for incorporating AI into education and make sure that laws encourage the moral and just application of AI (Delgado et al., 2020). By addressing the opportunities and challenges of adopting AI, this study hopes to contribute to a more inventive and inclusive educational environment in Malaysia.

## 2.0 LITERATURE REVIEW

### 2.1 AI in Education (AIEd)

The interdisciplinary and emerging field of Artificial Intelligence in Education (AIEd) has the potential to transform educational methods and outcomes. The integration of AI technologies into educational frameworks unveils both significant challenges and intriguing possibilities, as demonstrated by recent literature. Key themes, ranging from ethical considerations and the need for equitable access to pedagogical innovations and the implications for teacher training, have been identified by studies that have been conducted.

One primary focus of AIED is its transformative potential in enhancing personalised learning experiences. (Zhao, 2023) highlights that AI can revolutionise the educational landscape by making learning more effective and efficient, thus preparing students for the complexities of a rapidly evolving job market (Zhao, 2023). Likewise, (Kim, 2023) points out a growing societal demand for educational systems that incorporate AI principles to compete globally, treating AI not merely as a subject but as an essential skill that students must acquire (Kim, 2023).

The success of AIED integration is inherently linked to the preparedness of educators. In-service training, as examined by Davis (2024), revealed that teacher professional development (PD) programs enhance self-efficacy in implementing AI education. This notion aligns with the calls for comprehensive training articulated by (Alshehri, 2023), who argues that educators must possess not only technological skills but also the pedagogical knowledge necessary to harness AI for educational purposes (Alshehri, 2023). Thus, effective amalgamation of AI in education must prioritise the development of competencies among educators, which is essential to bridge the gap between technology and pedagogy.

As Artificial Intelligence in Education (AIED) continues to advance, ongoing communication among key stakeholders, such as policymakers, educators, and technologists, remains essential. According to Zhao (2023), nurturing collaboration that embraces a range of perspectives is vital for promoting ethical AI implementation in education. As more educational institutions integrate AI tools, it is equally important that policies that go beyond improving learning outcomes are developed to also sustain fairness and inclusivity.

### **2.1.1 Virtual Tutors in Education**

The integration of virtual tutors into educational settings represents a significant evolution in teaching and learning paradigms, particularly accelerated by the COVID-19 pandemic. Virtual tutors are designed to provide personalised, scalable, and interactive educational support, functioning effectively across diverse learning environments.

Virtual tutors operate as AI-based learning systems that utilise algorithms to simulate human tutoring experiences. They provide tailored educational support by adapting to learners' needs and preferences, facilitating personalised learning pathways (Jain et al., 2023). Kappel et al. (2022) emphasise the effectiveness of virtual learning platforms in enhancing education by enabling real-time interaction, personalised feedback, and adaptive learning experiences. Their study on the "Virtual Ward" illustrates how peer-to-peer tutoring within an AI-supported environment can complement conventional teaching methods that offer a flexible and engaging approach to medical education. Overall, they highlight that such platforms can significantly enrich learning by catering to diverse student needs while supporting collaborative knowledge exchange. Furthermore, the incorporation of conversational agents in learning analytics allows for formative assessments that encourage self-reflection among students (Lenk & Schmidt, 2022).

The role of a virtual tutor surpasses mere content delivery; it encompasses aspects of emotional and motivational support. This is especially evident in the tutoring dynamics established in virtual environments where the tutor acts as a guide, inspiring students while promoting the utilisation of digital tools (Kažoka & Pilmane, 2022). In addition, advancements in AI have led to the development of multimodal dialog systems, enhancing the interactive quality of tutoring experiences (Jain et al., 2023). This ability to engage students through various modalities enriches the learning experience and helps address the learning gap typically encountered in traditional educational settings.

## **2.2 AI in Accounting Education**

The incorporation of Artificial Intelligence (AI) into accounting education marks a significant transformation, aligning academic programs with the changing demands of the business world. The emergence of AI technologies opens up new opportunities for finance and accounting education, allowing educators to innovate their teaching approaches and improve student learning outcomes.

AI technologies are increasingly acknowledged for their transformative potential in the fields of finance and accounting. Tandiono (2023) notes that AI is significantly influencing accounting education by offering tools that support advanced analytical capabilities and real-time financial analysis. However,

integrating AI into academic curricula has yet to keep pace with these advancements. Similarly, Ghani et al. (2022) highlight an ever-changing landscape in employer expectations, with a rising demand for accounting graduates to possess strong technological competencies, particularly in AI, indicating a fundamental change in the skills required in the profession.

Moreover, AI applications facilitate personalised learning environments, enabling students to participate more interactively with course material. The use of intelligent tutoring systems can help address varied learning styles within the finance and accounting disciplines, as documented by Sarwari & Adnan (2024), who found positive correlations between student engagement and the use of AI tools in educational settings. This flexibility not only boosts learning but also equips students with critical thinking skills essential for navigating complex financial analyses.

Despite the high prospects for AI in education, major gaps remain, particularly in Malaysia. One major impediment is educators' and institutions' lack of awareness and understanding of AI technologies. Tandiono (2023) observes that there is insufficient discussion about how effectively existing accounting degrees match industry demands, as many graduates lack the practical, AI-oriented abilities necessary by employers. This gap shows that the curriculum is failing to adapt rapidly in response to technological advancements. Lee et al. (2024) also urge for an integrated content framework that incorporates ethical considerations into AI education, demonstrating that present academic approaches frequently neglect the moral consequences of AI adoption.

Moreover, cultural and institutional resistance to change complicates the transition towards more technologically infused educational practices. The persistence of traditional methods and an emphasis on foundational accounting principles often come at the expense of incorporating AI competencies into learning experiences. This misalignment contributes to graduates being ill-prepared for the demands of a technology-driven accounting profession (Ghani et al., 2022).

Even though AI has a lot of potential to improve accounting education, there are many obstacles in the way, especially in Malaysia. The importance of AI in accounting and finance research necessitates a review of teaching methods to make sure they are still applicable and efficient. Educational stakeholders can effectively prepare graduates to meet the demands of the profession in the future by implementing frameworks that integrate AI competencies alongside traditional accounting skills.

### **2.3 Benefits and Challenges in AI Adoption for Learning**

AI offers various advantages to its users. Firstly, AI helps facilitate personalised learning because it enhances student engagement, which will eventually improve their learning outcomes if they use the tools thoughtfully (Alotaibi, 2024). Besides, AI tools in education allow students to improve their communication and engagement in learning by providing peer-learning opportunities as well as learner-content interaction (Msambwa et al., 2025). AI tools like ChatGPT are one of the best aids in aiding students' and teachers' scientific research skills as it makes the research processes of various disciplinary areas more efficient and effective which requires its users to think critically and creatively to ensure the best quality of their research outcomes (Castillo- Martínez et al., 2024).

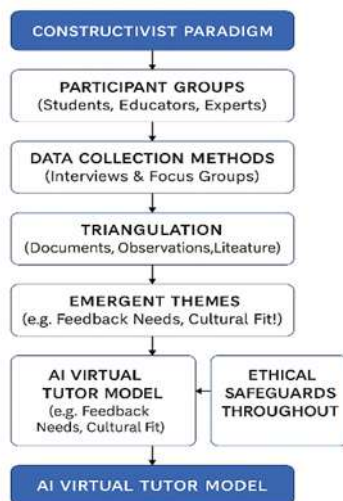
However, when incorporating AI-enhanced tools into higher education, there are certain issues to take into account. The use of AI tools without any ethical concern may lead to the issue of academic integrity, such as plagiarism and cheating, which are the main concerns in the academic world (Song, 2024). The issue of Algorithmic bias and data privacy is also some significant challenges that need to be addressed when using AI tools (Alotaibi, 2024). Therefore, it is crucial for the institutions involved to acquire new technological skills to effectively utilise AI pedagogically (Alotaibi & Alshehri, 2023). It is also important for us to have a critical reflection on the challenges and risks of AI, especially in the setting of higher education, as well as to have a further exploration of ethical and educational approaches (Olaf Zawacki-Richter et al., 2019).

## **3.0 RESEARCH METHODOLOGY**

### **3.1 Research Design**

This study emphasises the co-creation of knowledge through interactions between participants and researchers, utilising a qualitative research design grounded in a constructivist paradigm. This method makes sure the AI tutor model takes into consideration the contextual realities of Malaysian accounting students by exploring their distinct learning preferences and experiences. The constructivist lens allows

for deeper insights into how students and educators perceive and adapt to AI-driven tools, fostering a model prioritising experiential and scaffolded learning.



**Figure 1:** Constructivist Paradigm Framework

### 3.2 Data Collection

The data collection process for this study is designed to gather rich, qualitative insights from Malaysian accounting students and educators, ensuring the development of an AI-powered virtual tutor model tailored to their specific needs. To accomplish this, two main techniques are used: focus groups and semi-structured interviews. Purposive sampling is used in conjunction with these techniques to guarantee the selection of participants who possess pertinent knowledge and experience.

The study targets two key groups of participants: Malaysian undergraduate accounting students and educators from higher education institutions, including both public and private universities. In order to ensure thorough insights into their expectations for AI-based virtual tutors, accounting students are chosen to represent a variety of demographics, learning styles, and academic levels. Conversely, teachers offer insightful viewpoints on the pedagogical difficulties and institutional preparedness for the integration of AI in accounting education. Additionally, to validate the suggested features of the virtual tutor model and investigate scalability issues, focus groups are held with educational specialists who specialise in accounting education and AI integration.

The study employs purposive sampling, a non-probability sampling technique that enables the deliberate selection of participants based on their relevance to the research objectives. This method ensures that participants have direct experience with accounting curricula or exposure to AI tools in education. The sample size is guided by the principle of data saturation, whereby data collection proceeds until additional interviews or focus group discussions yield no new themes or insights.

Semi-structured interviews were conducted with Malaysian accounting students and educators to explore their perspectives on virtual tutors. Each interview lasts approximately 45–60 minutes and follows a flexible guide that allows for probing deeper into specific topics as they arise. For students, the interviews focused on their learning challenges, preferred teaching methods, and expectations for personalised AI tools. The interviews with educators looked at pedagogical gaps in accounting education, institutional obstacles to AI technology adoption, and their opinions on useful features for online tutors.

Focus group discussions are held with educational experts specialising in AI integration and accounting education. These sessions aim to validate the features identified during interviews and explore broader considerations such as scalability, adaptability to Malaysian cultural contexts, and alignment with local accounting standards. Each focus group consists of 6 to 8 participants and is structured to encourage collaborative brainstorming while ensuring all voices are heard.

The combination of semi-structured interviews and focus group discussions ensures a robust collection of qualitative data that captures diverse perspectives from students, educators, and experts. This approach facilitates a comprehensive understanding of the needs and preferences of Malaysian accounting students while addressing institutional factors critical to the successful implementation of AI-powered virtual tutors.

### **3.3 Data Analysis**

The data analysis process for this study involves a systematic and rigorous approach to uncover meaningful patterns and themes from the qualitative data collected through semi-structured interviews and focus group discussions. The primary method employed is thematic analysis, which is well-suited for identifying, analysing, and interpreting patterns of meaning within the data (Braun & Clarke, 2006). This method allows researchers to explore how participants perceive and interpret their experiences with AI-powered virtual tutors, ensuring that the developed model aligns with their needs and expectations.

Thematic analysis is conducted using NVivo software, which facilitates the organisation and coding of transcripts. The coding process begins with open coding, where initial themes and patterns are identified based on the raw data. This stage involves a detailed reading of transcripts to highlight key phrases or sentences that reflect participants' thoughts and experiences. Following open coding, axial coding is applied to connect and refine these themes, exploring how they relate to each other and the broader research objectives. For instance, themes might emerge around the importance of personalised feedback, cultural relevance, or integration with local accounting standards.

The coding process is iterative and involves multiple rounds of reviewing and refining code. This ensures that the themes identified are robust and accurately reflect the data. The coding framework is developed based on both deductive and inductive approaches. Deductive coding involves applying pre-existing concepts related to AI education and accounting curricula, while inductive coding allows for the emergence of new themes from the data itself. This mixed approach enhances the validity of the findings by balancing theoretical expectations with empirical insights.

To enhance the reliability and validity of the findings, triangulation is used to cross-verify the themes emerging from the interviews and focus group discussions with other data sources. This includes reviewing relevant documents such as university policies on AI adoption, observing classroom interactions where AI tools are used, and analysing any existing literature on AI in accounting education. Triangulation strengthens the foundation for creating an efficient AI-powered virtual tutor model by ensuring that the insights obtained are thorough and based on a variety of viewpoints.

### **3.4 Ethical Considerations**

Ethical considerations are integral to ensuring the safety, dignity, and rights of participants in qualitative research. This study adheres to established ethical principles, including informed consent, confidentiality, and data protection, to address the potential ethical challenges associated with collecting and analysing personal and sensitive data from Malaysian accounting students and educators.

Before agreeing to participate, participants receive comprehensive information about the study's goals, procedures, possible risks, and advantages. The process of obtaining informed consent guarantees that participation is completely voluntary and that participants are aware of their right to discontinue participation at any time without facing any repercussions. To accommodate people from a variety of backgrounds, consent forms are written in an easy-to-understand manner. The importance of continuous consent is also emphasised, enabling participants to renegotiate their participation as the study goes on.

To protect participant privacy, all identifying information is anonymised during data collection, analysis, and reporting. Names are replaced with pseudonyms or coded identifiers (e.g., "Student A" or "Educator 1") in transcripts and publications. Data is stored securely on encrypted devices and password-protected servers to prevent unauthorised access. These measures ensure compliance with confidentiality standards while fostering trust between researchers and participants.

## 4.0 FINDINGS & DISCUSSION

Thematic analysis of the qualitative data collected from semi-structured interviews and focus group discussions with undergraduate accounting students, educators, and AI experts from public and private universities revealed several salient themes regarding the development and implementation of AI-powered virtual tutors in Malaysian accounting education during the digitalisation era.

### 4.1.1 Theme 1: Adaptive Learning Pathways

The ability of AI tutors to adapt and customise learning experiences was a recurring theme. According to Informant A, "It really helps me focus on areas I struggle with because the virtual tutor adjusts the difficulty of questions based on my previous answers." In line with the findings of Zhang et al. (2021) and Hwang et al. (2020), this flexibility was widely commended for meeting each student's unique learning needs and allowing them to advance at their own speed.

### 4.1.2 Theme 2: Scaffolded Support and Real-Time Feedback

The instant feedback that AI tutors offered was consistently appreciated by participants. According to Informant B, "I was able to make early corrections to my accounting exercises, which enhanced my comprehension." Teachers agreed, emphasising that using AI tutors in real time helped students grasp difficult accounting concepts and offered prompt support when they ran into problems.

### 4.1.3 Theme 3: User-Friendly Interface

AI-powered virtual tutors' usability and accessibility were also highlighted. "The interface is easy to navigate, making it less intimidating to use AI tools," said Informant C. In line with Romero-Carazas et al.'s (2023) findings, a user-friendly design was found to be crucial for encouraging student participation and acceptance of AI-based learning tools.

### 4.1.4 Theme 4: Technological Infrastructure and Digital Literacy Gaps

Despite the benefits, a number of difficulties were noted. According to Informant D, "sometimes the system crashes or is slow, which disrupts my learning," some students complained about problems with system access and dependability. Furthermore, it was observed that students lacked digital literacy, which might limit the usefulness of AI tutors for all users. These results align with the pedagogical and technological issues raised by Ayatulloh et al. (2024).

### 4.1.5 Drawback: Lack of Personal and Individual Approach

A significant drawback identified was the lack of personal and individual approach in AI-based virtual tutoring. The lack of a human touch was emphasised by multiple informants. "The AI tutor can't understand my emotions or motivation like a human tutor can, which sometimes makes learning feel isolating," said Informant E. Both students and teachers shared this opinion, believing that the lack of a human component could impede the growth of more complex learner needs understanding and deeper student-tutor relationships (Ayatulloh et al., 2024; Kažoka & Pilmane, 2022).

### 4.1.6 Ethical and Pedagogical Alignment

Participants also raised concerns about the ethical use of AI and the need for alignment with pedagogical goals. Some educators questioned whether AI tutors could support deep learning rather than just automation, and whether their integration would align with broader educational objectives. These concerns reflect those raised in the literature (Ayatulloh et al., 2024; Delgado et al., 2020).

### 4.1.7 Summary of Findings

In summary, the findings illustrate that while AI-powered virtual tutors offer substantial benefits in terms of adaptability, feedback, and usability, they also present challenges related to technological readiness, digital literacy, ethical considerations, and the need for more personalised, human-centred support. The lack of a personal and individual approach remains a critical limitation that must be addressed for effective integration in Malaysian accounting education.

## 4.2 DISCUSSION

The findings of this study underscore both the transformative potential and the limitations of AI-powered virtual tutors in the digitalisation era of Malaysian accounting education.

#### **4.2.1 Enhancing Learning Through Adaptivity and Feedback**

Consistent with previous research (Zhang et al., 2021; Hwang et al., 2020), the adaptive learning pathways and real-time feedback provided by AI tutors were highly valued by students and educators. These features align with the need for personalised education, particularly in complex fields like accounting, where tailored support can significantly enhance understanding and performance.

#### **4.2.2 Usability and Student Engagement**

The importance of a user-friendly interface was a recurring theme, confirming that technological ease-of-use is critical for effective adoption (Romero-Carazas et al., 2023). When students find AI tools accessible, they are more likely to engage consistently and benefit from the technology.

#### **4.2.3 Challenges: Infrastructure and Digital Literacy**

However, the study also revealed significant challenges. The smooth integration of AI tutors can be hampered by problems with technological infrastructure and gaps in digital literacy, especially in environments with limited resources. These results confirm Ayatulloh et al.'s (2024) worries about the necessity of strong support networks and continual training in digital skills.

#### **4.2.4 The Human Element: Addressing the Lack of Personal Approach**

Perhaps most critically, this study highlights the persistent drawback of the lack of personal and individual approach in AI-based tutoring. The empathy, motivation, and nuanced understanding that human educators provide cannot be fully replicated by AI, even though it can produce personalised content (Ayatulloh et al., 2024; Kažoka & Pilmane, 2022). This drawback implies that AI tutors ought to be created to enhance human interaction in learning settings rather than to take its place.

#### **4.2.5 Ethical and Pedagogical Considerations**

The integration of AI in accounting education also raises important ethical and pedagogical questions. Ensuring that AI tools support deep learning, align with educational objectives, and are used ethically is essential for their successful adoption (Delgado et al., 2020). Educators and policymakers must work together to develop frameworks that address these concerns while maximising the benefits of AI-driven learning.

#### **4.2.6 Implications for Practice and Policy**

For AI-powered virtual tutors to reach their full potential, educational institutions must invest in both technological infrastructure and professional development for educators. Frameworks that promote AI integration while preserving the fundamentally human components of instruction and learning should be taken into account by policymakers (Delgado et al., 2020). Hybrid models that combine the effectiveness of AI with chances for mentoring and human connection should be given priority in future developments of AI tutors.

#### **4.2.7 CONCLUSION OF DISCUSSION**

In general, the study offers insightful information about the potential and difficulties of incorporating AI-powered virtual tutors into Malaysian accounting instruction in the age of digitalisation. Even though these tools have a lot of potential to improve learning outcomes, their effective and equitable use requires careful consideration of technological, ethical, and human-centered issues.

### **5.0 Implications & Recommendations**

The findings from this study on the development and implementation of AI-powered virtual tutors in Malaysian accounting education during the digitalisation era have several significant implications for educators, students, policymakers, and technology developers. The insights gained highlight both the transformative opportunities and the challenges that must be addressed to maximise the benefits of AI integration in higher education.

#### **5.1 Implications for Educators and Institutions**

The emergence of adaptive learning pathways and real-time feedback mechanisms within AI-powered virtual tutors provides educators with innovative tools to personalise instruction and support student mastery of complex accounting concepts. These systems' capacity to modify the level of difficulty of the

content and offer prompt feedback can support differentiated instruction and raise student engagement levels in general (Zhang et al., 2021; Hwang et al., 2020). The study does, however, also emphasise how critical it is to acknowledge AI's limitations, especially the absence of a customised and individualised approach present in the majority of virtual tutoring programs. As multiple informants pointed out, a lack of human empathy and nuanced understanding can cause some students to feel isolated during learning experiences, which may have an impact on motivation and deeper learning (Ayatulloh et al., 2024; Kažoka & Pilmane, 2022).

Institutions must therefore consider strategies that blend AI-driven instruction with opportunities for human interaction, such as mentorship programs, group discussions, and regular check-ins with educators. This hybrid approach can help mitigate the drawbacks of AI while leveraging its strengths to enhance learning outcomes.

### **5.2 Implications for Policymakers**

The integration of AI in accounting education requires robust digital infrastructure and comprehensive digital literacy initiatives to ensure equitable access and effective utilisation. To minimise disruptions and maximise the reach of AI-powered learning tools, policymakers should prioritise investments in modernising technological infrastructure, especially in institutions with limited resources. To guarantee that AI technologies are used responsibly, promote deep learning, and complement national educational goals, it is also crucial to establish explicit ethical standards and regulatory frameworks (Delgado et al., 2020).

### **5.3 Implications for Technology Developers**

For technology developers, the findings underscore the importance of designing AI-powered virtual tutors that are not only technologically advanced but also user-friendly and pedagogically relevant. Developers ought to concentrate on producing user-friendly interfaces and adaptive learning tools that meet the needs of a wide range of students. Furthermore, hybrid models that integrate AI's efficiency with meaningful human interaction mechanisms, like teacher-led interventions or integrated peer collaboration tools, need to be investigated.

### **5.4 Recommendations**

Based on the findings and implications, the following recommendations are proposed:

#### **5.4.1 Adopt Hybrid Tutoring Models:**

Institutions should implement hybrid models that combine AI-driven personalised learning with regular opportunities for human interaction. This approach can address the lack of personal and individual approach in current AI systems and foster a more holistic learning environment.

#### **5.4.2 Enhance Digital Infrastructure and Literacy:**

Educational institutions and policymakers must invest in upgrading digital infrastructure and providing ongoing digital skills training for both students and educators to ensure equitable access and effective use of AI-powered virtual tutors.

#### **5.4.3 Continuous Professional Development:**

Regular training and professional development programmes should be offered to educators to enhance their capacity to integrate AI tools effectively and ethically into their teaching practices.

#### **5.4.4 Establish Ethical and Pedagogical Oversight:**

Institutions should form oversight committees to review the alignment of AI tools with pedagogical objectives and ethical standards, ensuring that AI supports, and not substitutes, core educational values.

#### **5.4.5 Implement Ongoing Monitoring and Feedback Mechanisms:**

Mechanisms for regular feedback from students and educators should be established to inform iterative improvements of AI-powered virtual tutors, ensuring they remain relevant and effective in meeting the evolving needs of accounting education.

## 6.0 CONCLUSIONS

In conclusion, this study provides comprehensive insights into the development and implementation of AI-powered virtual tutors in Malaysian accounting education during the digitalisation era. Learning outcomes and student engagement could be greatly improved by combining real-time feedback, scaffolded support, adaptive learning pathways, and user-friendly interfaces. However, challenges such as technological infrastructure limitations, digital literacy gaps, and, most notably, the lack of a personal and individual approach must be addressed for successful and equitable adoption.

The findings emphasise that while AI tutors can personalise and scale learning, they cannot fully replicate the empathy, motivation, and nuanced understanding provided by human educators. Thus, hybrid models that combine the advantages of artificial intelligence with the indispensable value of human interaction should be the main focus of accounting education in Malaysia in the future. To establish ethical frameworks, encouraging environments, and chances for ongoing professional development, policymakers, educators, and tech developers must work together.

Higher education in Malaysia can fully utilise AI-powered virtual tutors by tackling these issues and taking advantage of the opportunities that AI presents. This will guarantee that technological advancements result in inclusive, effective, and meaningful learning experiences for all accounting students. This study contributes valuable knowledge to the field and offers a practical framework for integrating AI-driven tools to support the evolving needs of accounting education in Malaysia.

### 6.1 Contribution to AI Research in Accounting Education

This research contributes to the growing body of knowledge on AI integration in accounting education by providing empirical insights from Malaysian higher education contexts. It extends the Technology Acceptance Model by highlighting the critical role of optimism, innovativeness, and superior functionality in shaping students' intentions to use AI, while also identifying discomfort as a significant barrier (Krishnanraw & Ismail, 2025). The study offers a comprehensive framework for designing AI tutors tailored to accounting students' learning needs, emphasising pedagogical scaffolding and cognitive load management. Furthermore, it informs policymakers and educators about the infrastructural and ethical considerations necessary for sustainable AI adoption, aligning with Malaysia's national digital transformation goals (MIA, 2023; Delgado, Smith, & Lee, 2020).

### 6.2 Limitations of the Study & Suggestions for Future Research

Although this study provides insightful information, the findings may not be as broadly applicable to other academic fields or contexts due to its qualitative design and narrow focus on Malaysian undergraduate accounting students and instructors. The range of viewpoints may also be constrained by the sample size and geographic concentration. To confirm and expand on these findings, future studies should use mixed methods techniques and bigger, more varied samples. To evaluate the long-term effects of AI tutors on learning outcomes and professional preparedness, longitudinal studies are advised. Additionally, exploring AI adoption in other accounting education contexts, such as professional certification programs and continuing education, would provide a broader understanding of AI's role in the accounting profession (Krishnanraw & Ismail, 2025; MIA, 2023).

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### Declaration of Generative AI And AI-Assisted Technologies in the Writing Process

During the preparation of this work, the author(s) used AI-assisted technologies in order to assist with summarising literature, refining language, clarifying theoretical concepts, and organising key findings. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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