International Journal of Education and Practice
2025 Vol. 13, No. 3, pp. 923-942
ISSN(e): 2310-3868
ISSN(p): 2311-6897
DOI: 10.18488/61.v13i3.4322

Evaluating teachers' perspectives on education-based assessments strategies with artificial intelligence

Kenny S.L Cheah[1+]
ShanShan Tang[2]
Janitha Kularajasingam[3]
Manimekalai Jambulingam[4]
Wen Fen Beh[5]

[1]*Faculty of Education, University Malaya, Malaysia.*
[1]*Email: kennycheah@um.edu.my*
[2]*Institute for Advanced Studies, University Malaya, Malaysia.*
[2]*Email: tangshanshan888@gmail.com*
[3,4]*Faculty of Business and Law, Taylor's University, Malaysia.*
[3]*Email: Janitha.Kularajasingam@taylors.edu.my*
[4]*Email: Manimekalai.Jambulingam@taylors.edu.my*
[5]*Faculty of Creative Arts, University Malaya, Malaysia.*
[5]*Email: beh.wenfen@um.edu.my*

(+ Corresponding author)

Article History
Received: 29 January 2025
Revised: 26 June 2025
Accepted: 7 July 2025
Published: 24 July 2025

Keywords
AI Impact on teaching
AI implementation challenges
Artificial intelligence in education
Educational assessments
Educator readiness for AI.

ABSTRACT

This paper explores the possible effects of artificial intelligence (AI) on educational assessments with a focus on implementation challenges, assessment accuracy and institutional preparedness. Online questionnaires that included quantitative and qualitative methods were used to collect data from 68 postgraduate students and teachers at a Malaysian university utilising a sequential case study methodology. We used a self-designed tool comprising a validated questionnaire with Cronbach's alpha (0.76). The results draw attention to ethical questions, assessment accuracy problems, and a notable information gap regarding the use of artificial intelligence in education. Teachers had neutral to somewhat positive opinions on how artificial intelligence affects assignment accuracy though they voiced worries about its limitations. Although the integration of artificial intelligence shows potential, teachers underlined the necessity of further training and more solid institutional support. Though issues including ethical considerations and instructor preparedness still exist, artificial intelligence has the potential to improve assessment accuracy and efficiency. Good integration calls for a mixed strategy combining human supervision with AI's advantages. This paper emphasizes the need for institutional policies and professional growth to help artificial intelligence adoption in the sector. Maximizing the advantages of artificial intelligence and reducing its negative effects depend on addressing the worries of teachers.

Contribution/Originality: This study uses a mixed-methods approach, integrating verified quantitative tools with qualitative insights, so uniquely analyzing teachers' impressions of AI-driven assessments. Unlike earlier studies, it examines institutional readiness and ethical issues in AI adoption offering a fresh perspective for juggling the benefits of artificial intelligence with academic integrity in tests of learning.

1. INTRODUCTION

In today's technology-driven era, the rapid development of artificial intelligence (AI) is drastically changing the entire education landscape. Consequently, graduate students are increasingly interested in transitioning to AI tools to enhance their learning experiences. This trend has provided students with more efficient and effective study methods. However, it also brings new challenges for teachers. The recent development of AI applications, particularly in the education sector poses additional challenges where gaps in access to educational resources are becoming more evident in Malaysia. Some universities have introduced and implemented several AI-driven

learning systems to accommodate learning experiences and improve course delivery to address these issues. Furthermore, teachers believe that assessment methods should be adapted to the emergence of AI technologies like ChatGPT, Jenni.Ai, Conch AI, and others. One significant benefit would be the transformation of traditional teaching methodologies and assessment strategies leading to a greater integration of technology usage. According to academics, AI-powered tools can simplify relevant tasks (Alam, 2021). AI widely integrates conventional teaching approaches and evaluation techniques regarding educational processes and procedures. For instance, some AI tools, like ChatGPT are challenging traditional assessment methods, particularly in the education industry. AI enables technologies to grade instantly, provide immediate feedback to students, and adjust to student learning preferences (Benjamins & Salazar, 2020; Kousa & Niemi, 2023). AI technology will further assist with changes in the structure and method of assessments to ensure a better perspective of students' performance (Chowdhery, Jasmin, Jaiswal, & Jothi, 2021). Recently, according to Razali, Zakariah, Hanapi, and Rahim (2022) both teachers and students have been utilizing AI tools for teaching and learning, particularly in content writing and development. These tools provide instant feedback and suggestions to ensure that efficiency is maximized. However, the constant usage of AI tools in education raises ethical concerns, potential biases, and the risk of disseminating inaccurate information which could eventually reduce students' learning ability. Several crucial factors must be considered when incorporating AI in assessments, especially regarding content that appears original and requires proper redesign. Researchers need to investigate novel methods further to ensure that higher-order thinking, problem-solving, and critical thinking skills are less vulnerable to AI manipulation. It is also vital to maintain a balance between technology and learning, especially when AI enables an automated grading system and provides instant feedback, which could delay authentic learning.

2. BACKGROUND OF THE STUDY

Recently, artificial intelligence (AI) tools have been introduced into the education system, playing a significant role in enhancing the capabilities of educational professionals and students. Consequently, a wide range of arguments has arisen concerning these developments, particularly regarding assessment, student engagement, and the role of AI tools among teachers. Communication between students, teachers, and administrators is the core activity within the education system, providing real-time feedback and suggestions that ease teachers' workloads (Karaca & Kılcan, 2023). There is a need to understand teachers' perceptions of AI's impact on learning, assessment, and communication (Griffiths & Cubric, 2024).

2.1. AI's Impact on Education

According to administrative procedures and pedagogical approaches to learning environments, artificial intelligence has fundamentally changed education (Luckin, Holmes, Griffiths, & Forcier, 2016). AI-driven tools include adaptive learning platforms and intelligent tutoring systems have transformed student interaction with content and teacher delivery of education (Woolf, 2010). Artificial intelligence applications in education historically provide limited but tailored feedback to students originally starting with rule-based tutoring systems in the 1970s and 1980s. Advances in machine learning, natural language processing, and data analytics over time have enabled the development of complex instructional platforms that fit content depending on students' learning habits and performance measurements (Heffernan & Heffernan, 2014). These advances indicate a more general shift toward data-driven decision-making in education in which AI-generated insights guide curricula and instructional practices, hence improving learning results (Popenici & Kerr, 2017).

Beyond personalizing, AI has improved evaluation techniques and automated administrative chores maximizing instructional efficacy. Early intervention plans enabled by AI-powered analytics give teachers real-time insights into student development, therefore supporting at-risk students (Selwyn, 2019). Artificial intelligence-based assessment instruments have brought creative substitutes for conventional standardized testing that provide real-

time formative assessments measuring critical thinking and problem-solving ability. However, these developments present difficulties like algorithmic prejudice, data privacy issues, and ethical questions about artificial intelligence decision-making in the classroom (Popenici & Kerr, 2017). Policymakers, teachers, and technologists working together will help to guarantee fair and responsible AI application in educational environments by addressing these challenges. The incorporation of artificial intelligence into education should be accompanied by ethical issues and thorough assessment as it develops to support an inclusive, student-centred learning environment (Luckin et al., 2016).

According to Vaithilingam, Zhang, and Glassman (2022), students perceive AI tools as effective for problem-solving and addressing writing issues. They prefer and will adopt AI tools to enhance their assessments. Lee (2018) identified four areas of AI-enabled education: teaching and learning in classrooms, creating personalized lessons, grading assessments, and providing feedback on students' performance. AI has the capability of generating information for student assessments which necessitates new forms of assessment to prevent plagiarism and ensure that students gain knowledge.

2.2. Challenges and Ethical Concerns in AI Use in Education

Artificial intelligence (AI) integration into education presents major advantages as well as ethical and pragmatic difficulties. Since artificial intelligence systems depend on enormous volumes of student data including behavioral patterns and academic achievement, data privacy and security remain among the most urgent issues (Luckin et al., 2016). Lack of robust security mechanisms raises the risk of data leaks and cyberattacks, therefore compromising institutional integrity and student privacy. Reducing these hazards respects both the General Data Protection Regulation (GDPR) and the Family Educational Rights and Privacy Act (FERPA) among laws. Moreover, artificial intelligence-driven learning systems could unintentionally encourage algorithmic prejudices, therefore supporting unfair treatment of particular student groups. If training sets lack diversity, AI-powered assessments may disproportionately affect underprivileged people, therefore aggravating previously existing educational gaps (Popenici & Kerr, 2017). Maintaining justice in educational decisions requires extensive testing and openness in artificial intelligence research.

The digital divide substantially limits the equitable deployment of artificial intelligence in education beyond concerns of data security and bias. Underprivileged students may lack necessary technologies and high-speed internet, therefore aggravating their educational differences (Selwyn, 2019). Moreover, the complexity of AI-driven decision-making raises issues about responsibility and transparency, therefore, determining when mistakes occur becomes difficult (O'Neil, 2016). Growing automation of instructional responsibilities also raises questions about the possible depersonalization of education and the prospect of replacing teaching staff. Although artificial intelligence can improve teaching by automating administrative duties and offering individualized learning, it must complement rather than replace human teachers to preserve the fundamental social and emotional dimensions of education (UNESCO, 2021). Emphasizing ethical issues including informed permission, student autonomy, and fair access to AI-enhanced learning experiences can help to guarantee appropriate AI integration by means of cooperation among educators, legislators, and technologists.

Therefore, there is a need to teach the productive use of AI tools as aids rather than relying excessively on them. For example, Chounta, Bardone, Raudsep, and Pedaste (2022) developed a framework with fairness, accountability, transparency, and ethics (FATE) to explore K-12 teachers' perceptions of AI tools used in education. The study revealed that teachers have limited knowledge about AI tools compared to students. Teachers are highly concerned about security, sterile emotions, ethical considerations and the undermining of an inquisitive mindset despite acknowledging that AI tools enhance learning outcomes. Teachers view AI tools as supplementary, recognizing potential benefits and expressing a willingness to explore these tools (Chou, Shen, Shen, & Shen, 2023; Zhao, Wang, Gao, & Zhang, 2022). Irrespective of various age groups, academic backgrounds, and years of working

experience, teachers' perceptions are generally positive toward using AI tools in education. AI tools will be widely adopted by educational institutions in the future. However, teachers may not yet fully experience AI support in assessments. Teachers should utilize these tools first to fully integrate them into the assessment process before the successful implementation of AI assessments in schools (Kim & Kim, 2022).

2.3. Problem Statement

The education industry faces significant opportunities and challenges with the rise of artificial intelligence (AI). The integration of AI into learning experiences and teaching strategies has revolutionized evaluation procedures leading to improvements in consistency and outcomes. In this case study, teachers pursuing postgraduate degrees at the Faculty of Education in a Malaysian public university experience a unique dilemma. These teachers are concerned that over-reliance on AI tools like ChatGPT might impede students' cognitive development and independent thinking while recognizing AI's potential to enhance student experiences and streamline administrative tasks. There is a persistent worry that students may not fully develop critical thinking skills necessary for independent problem-solving despite AI's transformative promise. This study seeks to identify the best practices for incorporating AI into educational assessments while maintaining academic integrity and fostering cognitive development among students.

2.4. Purpose of Study

This study aims to explore the optimal ways to integrate AI into educational practices, particularly in assessments following of the problem statement. Additionally, it will address the benefits, issues, and challenges related to generative AI (Gen AI) focusing on practical methods to incorporate technology effectively while maintaining academic integrity. The following survey questions were asked from teachers who are currently pursuing their postgraduate degree program in the Faculty of Education of a Malaysian public university to address the purpose of the study:

1. How do you envision the future role of AI in shaping the educational landscape, particularly in assessments and assignments?
2. Can you discuss any ethical considerations or concerns you have regarding the use of AI in education? How do you address these in your practice?
3. What are your thoughts on student engagement and motivation in assignments with AI components? Have you noticed any changes?

3. METHODOLOGY

This explanatory sequential case study was targeted towards teachers who are currently pursuing their postgraduate degree program in the Faculty of Education of a Malaysian public university. Random sampling was deployed as the sampling methodology using a *Google Form* online questionnaire that contains both 5-point Likert-scale and open-ended questions. Participants were chosen using particular criteria including voluntary study involvement, enrollment in postgraduate education programs, and active teaching responsibilities. Descriptive statistical techniques were applied to the quantitative data to spot trends and patterns in teachers' opinions of artificial intelligence integration within their respective fields. Qualitative replies underwent theme analysis to provide a more nuanced understanding of issues, ethical questions, and institutional preparedness for artificial intelligence acceptance. This mixed-method approach offered a whole knowledge of how artificial intelligence is seen and applied in methods of educational evaluation.

The procedure starts with an invitation to all program teachers to allow the dissemination of the online questionnaire to their respective courses and programs in the Faculty of Education. Most of the WhatsApp groups from the selected university are approached to voluntarily to participate in this research. After receiving their

consent, they were forwarded with the *Google Form* link through WhatsApp starting June 1, 2024. Subsequently, the flowchart continued with the next actions in the data analysis stage. A total of 68 replies were gathered overall when data collecting ended on June 15, 2024, the technique splits into two analysis phases. One phase consists of the statistical or numerical assessment techniques suggested by the study of quantitative data from the obtained replies. Aiming to find trends or themes in the replies to each research question, the second phase simultaneously concentrates on coding and thematic analysis of qualitative data. Combining quantitative rigor with qualitative depth to provide a well-rounded knowledge of the results of the research guarantees a thorough examination of the data using this twin technique. Lastly, the ethical committee of the relevant university approved this study on the 5th of February 2024 (Ref. No. TNC2/REC_3591). Figure 1 shows the flowchart to indicate the process of participant selection in this study to clearly explain the process of approaching the samples.

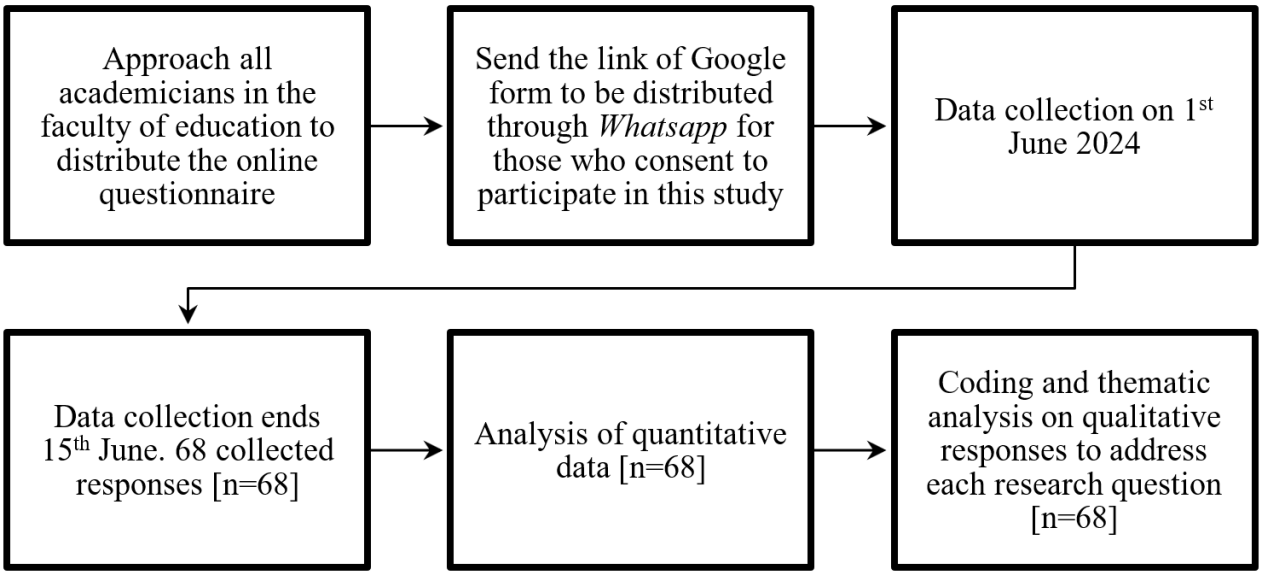

Figure 1. Flowchart to indicate the process of participant selection in this study.

On the other hand, the instrumentation design phase was constructed through a process to improve its reliability and validity. A pilot study helps to ensure that these questions are acceptable and intelligible for the target population, therefore confirming the instrument's readiness and clarity. Cronbach's alpha was used to assess the dependability of the instrument in a study including thirty academics from different universities who are not actual respondents in this study. This assessment gauges how interconnected a group of items is. Cronbach's alpha score of 0.76 implies a degree of dependability showing that the questionnaire questions give results throughout the studied population. In the realm of sciences, an alpha value exceeding 0.7 generally signifies internal consistency. The questionnaire acts as a tool for analyzing the targeted concept using replies to questions demonstrating coherence with one another.

Questions are refined to ensure consistent replies across participants, therefore addressing trustworthiness to ensure a rigorous expert reviewer feedback. Three academicians from education field agreed to act as the experts review process emphasizing three public universities in Malaysia. They verified its alignment with study objectives and its capacity to properly record desired information, before it was deployed out through Google Forms. In terms of data collection process, the quantitative phase started with a survey asking teachers how artificial intelligence (AI) affects evaluations using a 5-point Likert scale. They were questioned about the correctness of assignments when students use GenAI issues encountered, methods for improving assessment accuracy and preparedness for artificial intelligence integration. For its analysis, descriptive statistical methods were used to explore their perspectives on these facets. This study could eventually evaluate the findings against the objectives of the research

and the gathered data in the coding process, the themes emerged as data achieved saturation points indicating sufficiency of analysis when the same opinions were mentioned repeatedly among the respondents using descriptive statistics and thematic analysis on the open-ended questions.

4. FINDINGS

In the quantitative findings, this phase quantifies teachers' opinions on the adoption and integration of AI inside academic settings by focusing on three main dimensions: (a) impact of AI on assignment accuracy. (b) Challenges and strategies in AI implementation. (c) Readiness for AI Adoptions. As an illustration, the descriptive statistical finding in Table 1 provides a basic understanding for comprehending the complicated terrain of artificial intelligence adoption in education proposing a cautious optimism tempered by a clear awareness of current challenges and the requirement of significant institutional support.

Table 1. Mean and standard deviation of teachers' opinions on the adoption and integration of AI inside academic settings.

Dimensions	Questions	Mean	Standard deviation
Dimension 1: Impact of AI on assignment accuracy			
Q1	Using AI enhances the precision of students' academic tasks.	3.2	1.3
Q2	Incorporating AI minimizes mistakes in assignments.	3.0	1.2
Q3	AI software helps students grasp course material.	3.1	1.5
Q4	AI systems ensure consistent grading of assignments.	2.9	1.6
Q5	Integrating AI motivates critical thinking and problem-solving.	3.3	1.1
Dimension 2: Challenges and strategies in AI implementation			
Q6	I face difficulties incorporating AI tools in assessments.	3.1	1.2
Q7	I know methods to tackle inaccuracies with AI in assignments.	3.2	1.3
Q8	Consistent training with AI tools is crucial for accuracy.	2.8	1.5
Q9	AI ensures impartial grading.	3.0	1.4
Q10	AI encourages students to engage in thinking and problem-solving.	3.1	1.1
Dimension 3: Readiness for AI adoption			
Q11	I am ready to use AI tools for assessing assignments.	3.2	1.6
Q12	My university supports AI use.	2.9	1.4
Q13	Ongoing AI training is key for readiness.	3.0	1.3
Q14	We have funding for AI technology.	3.1	1.5
Q15	Our institution supports AI integration.	2.8	1.2

Table 1 reflects moderate variability in responses across all dimensions suggesting that there is recognition of the potential benefits of AI. There are also significant concerns about challenges and readiness that need to be addressed:

a. Impact of AI on Assignment Accuracy: Teachers generally perceive AI as beneficial for enhancing accuracy and critical thinking in assignments but their agreement is neutral to slightly positive.
b. Challenges and Strategies in AI Implementation: There is a general agreement that AI poses challenges in implementation though there's an acknowledgment of its benefits in ensuring fairness and enhancing assessment accuracy.
c. Readiness for AI Adoption in Education Assessments: Teachers show a neutral to mildly positive view on their readiness and the support from their institutions for adopting AI indicating some reservations and variability in readiness levels.

These results provide a complex picture of the teachers' neutral to somewhat favourable opinions on the usage of artificial intelligence to improve the quality of their assignments including critical thinking abilities and assignment accuracy. Concurrently, it draws attention to the technical, pedagogical, and logistical difficulties teachers have as well as the major obstacles in the absorption of artificial intelligence technologies. The results show different degrees of preparedness across institutions to completely integrate artificial intelligence, which

supports the different degrees of support and resources accessible and helps to affect the efficient use of artificial intelligence in educational processes.

4.1. Qualitative Findings

1. *How do you envision the future role of AI in shaping the educational landscape, particularly in assessments and assignments?*

The future role of AI in shaping the educational landscape, especially in assessments and assignments, appears poised for significant evolution as detailed in the provided Figure 2. As an overview, three important areas of use for artificial intelligence are improved feedback and evaluation, personalizing and efficiency in learning, and teacher assistance.

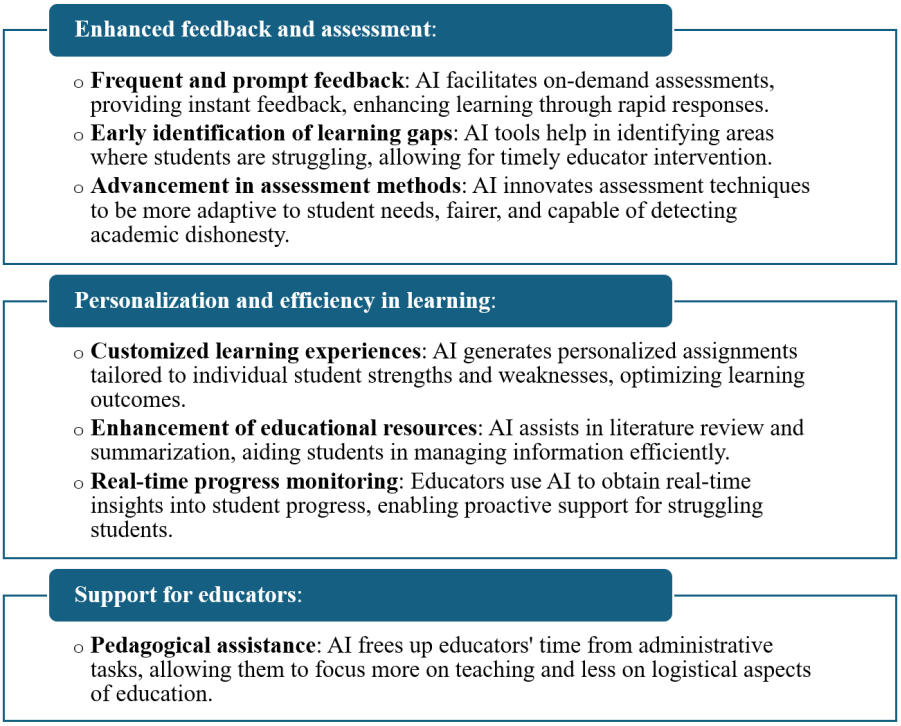

Figure 2. Advancements in AI-driven educational assessment.

Improved Feedback and Assessment: AI provides students with timely, customized comments that greatly improve assessment. Respondent 53 said that

"Instant feedback from AI helps us learn right after assignments."

This fast feedback system helps students to spot areas needing work, so promoting better understanding and performance. Driven by artificial intelligence, evaluations dynamically change difficulty and focus depending on student performance, therefore better addressing personal learning needs. Artificial intelligence also enhances academic integrity by spotting possible dishonesty in tests. Respondents 24 and 47 mentioned that

"Immediate AI feedback helps us right away."

"Assessments will change with AI, no more one-size-fits-all tests."

AI optimizes learning results by customizing experiences to fit individual strengths and shortcomings. AI helps teachers as well as students by aggregating data and aiding resource management.

Respondent 21 highlighted that

"AI tailors learning so it fits each student's needs perfectly."

Respondent 34 added that

"AI's real-time updates help teachers support us better."

Artificial intelligence helps teachers by lowering administrative tasks so they may concentrate on teaching. For example, Respondent 16 talks about teachers adopting artificial intelligence to handle administrative responsibilities, stressing a "work smarter not harder" strategy that fits releasing teachers to concentrate more on educational elements.

"AI will free up teachers to focus on teaching not paperwork."

This enhances the quality of education and improves teaching efficiency by allowing teachers to give more time and resources to student engagement and customized learning. Respondents 30 and 35 added that

"AI helps teachers so they can teach more and do less admin."

"AI doing admin stuff means teachers teach us more with less paperwork."

In a nutshell, these observations show how artificial intelligence is transforming education by improving teaching and learning opportunities and streamlining administrative tasks.

2. *Can you discuss any ethical considerations or concerns you have regarding the use of AI in education? How do you address these in your practice?*

Ethical issues about the integration of artificial intelligence in education center on security, openness, and fairness. Ensuring responsible AI deployment calls for resolving data privacy, reducing biases, and preserving ethical oversight to support an equal and efficient learning environment. Figure 3 outlines several key areas of ethical importance, ethical and responsible AI Use, privacy and security, and educational enhancement and support.

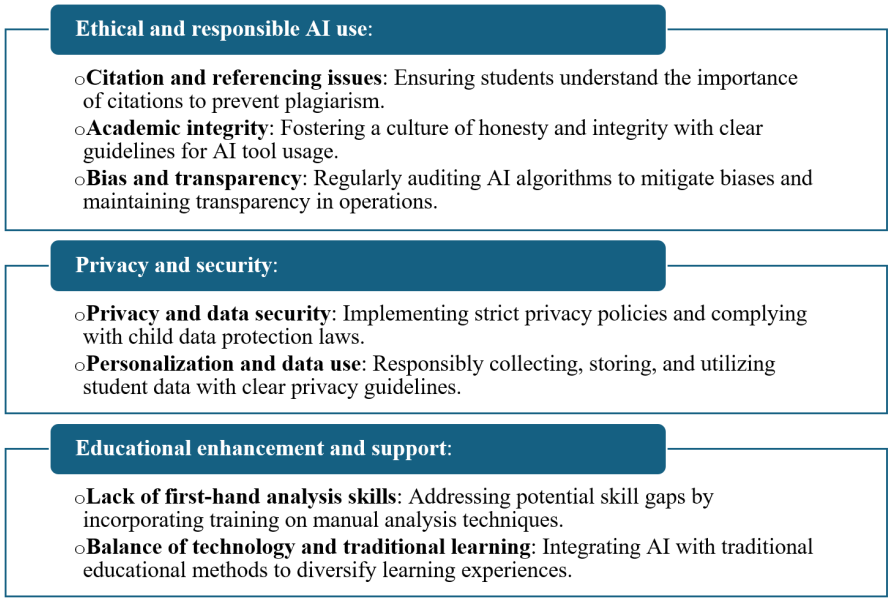

Figure 3. Ethical dimensions of AI in education.

Ethical and Responsible AI Use: This section emphasizes the need for appropriate citation and reference to avoid plagiarism—a fundamental habit as artificial intelligence is included into student learning and evaluation. It also underlines the need for encouraging academic honesty and routinely checking artificial intelligence systems to guarantee they run free from prejudice and with openness. According to respondents 16 and 10,

"AI must be clear and open, so we know it's fair to everyone".

"AI needs to be checked for fairness, no hidden stuff".

In essence, maintaining confidence and fairness in educational evaluations and tools depends on these methods.

Privacy and Security: Protecting student data comes first given the rise in data-driven teaching resources. This

entails putting strong privacy rules into effect and guaranteeing data protection legislation compliance. The figure emphasizes the importance of ethical data collecting, storage, and use so that strict privacy rules control all AI interactions. Respondent 8 mentioned that

"Our private information must be protected".

Respondent 14 had also mentioned major ethical questions about personal privacy and student data security,

"AI handling our information must follow strict rules to protect us."

Educational Enhancement and Support: AI's contribution to education goes beyond preserving moral norms to include improving methods of instruction. This covers any skill gaps by including training on manual analysis techniques and blending artificial intelligence technology with conventional teaching approaches to vary learning opportunities. These strategies guarantee that artificial intelligence enhances rather than replaces basic educational ideals and practices. Respondent 20 highlighted that

"AI and books should go hand in hand in our learning."

Striking a balanced education depends on human-led instruction which also guarantees that students acquire basic analytical techniques in addition to using artificial intelligence. Respondent 24 mentioned that

"We need to still learn old-school analysis not just rely on AI."

Practically, resolving these ethical issues means ongoing education on AI capabilities and constraints for teachers and students, thereby guaranteeing that all stakeholders are aware and ready to utilize AI ethically and successfully.

3. *What are your thoughts on student engagement and motivation in assignments with AI components? Have you noticed any changes?*

According to the findings, the introduction of AI components in educational assignments has been transformative in terms of student engagement and motivation. Figure 4 outlines key areas where AI enhances the educational experience: Enhanced engagement and interactive learning, personalization and efficiency in education, and supportive feedback and tool familiarity.

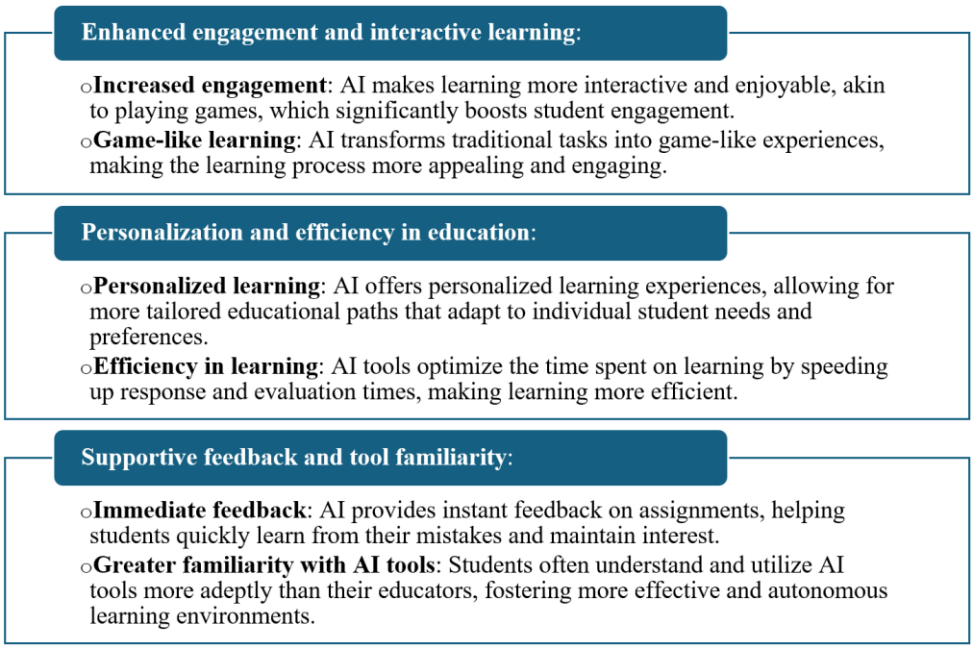

Figure 4. Maximizing student engagement through AI.

Enhanced Engagement and Interactive Learning: Artificial intelligence has made studying more engaging and fun, like playing games which greatly increases student involvement. This gamification of learning enables

conventional duties to become more interesting events, therefore enhancing the educational process and appealing to the students. Maintaining student interest and involvement in their educational paths depends on this change. Respondents 2 and 41 said that

"Learning with AI is like playing a smart game that teaches us a lot."

"Learning with AI feels like a game, keeps me interested all the time."

Personalization and Efficiency in Education: A major change in educational paradigms is the capacity of artificial intelligence to provide customized learning experiences that fit the particular requirements and preferences of students. AI solutions provide a more customized educational route that fits each student's speed and degree of knowledge by optimizing the time spent on learning via effective response and assessment times, hence improving learning efficiency. Respondent 6 said that

"AI customization helps me focus better because I learn in a way that suits me."

Respondent 20 also mentioned that

"With AI, I can learn at my own pace, really helps me focus."

Teachers can speed up the grading process and provide fast comments, therefore accelerating the learning process by lowering the waiting time for tests and enabling students to interact more actively and constantly with their learning materials. Respondent 28 mentioned that

"AI cuts down waiting time for feedback, so we spend more time in learning."

Supportive Feedback and Tool Familiarity: Tool familiarity and supportive feedback from artificial intelligence on assignments help students to rapidly learn from their errors and keep their interest in the topic. Moreover, students often even more so than their teachers become skilled in utilizing these technologies which promotes a more efficient and independent learning environment. Respondent 11 said that

"I get feedback right away with AI, so I know what I need to fix fast."

For students, this fast feedback and growing familiarity with digital technologies help to explain a deeper engagement and continuous motivation. Respondent 45 said that

"Getting quick feedback from AI helps us learn faster without getting bored."

In a nutshell, these findings taken together show that artificial intelligence components not only make learning more interesting and tailored but also improve educational delivery by increasing its responsiveness to student demands.

5. DISCUSSION

5.1. Impact of AI on Assignment Accuracy

Artificial intelligence (AI) has been progressively included in educational environments emphasizing improving instructional efficacy and assignment correctness. The common sentiments revealed that teachers believe that artificial intelligence (AI) may help them to improve accuracy and encourage critical thinking among their students , therefore enhancing their practice (Kim & Kim, 2022). Using artificial intelligence in the classroom is considered as a way to help teachers identify specifically defined instructional responsibilities and provide more precisely produced materials (Lin, 2022). AI may also help content be more suited for students' knowledge levels and provide customized suggestions for learning resources catered to particular student requirements (Chounta et al., 2022). More precise and focused assignments that meet the particular needs of every student may result from this tailored approach aided by artificial intelligence (Ahmad, Rahmat, Mubarik, Alam, & Hyder, 2021).

The findings from the first research question corroborate with recent findings internationally. Some studies have shown that artificial intelligence may either automate or semi-automate heavy and mechanical chores, freeing teachers to concentrate more on creative teaching approaches (Chou et al., 2023). Teachers may simplify activities such as grading, data analysis, and literature reviews by using AI technology, therefore improving the correctness and efficiency of their assignments (Mudawy, 2024). Moreover, the use of artificial intelligence in education has the

possibility to produce virtual learning environments, provide individualized learning experiences, and automate grading procedures, all of which may help to raise assignment correctness (Jurado, 2023).

Teachers' opinions greatly affect how effectively artificial intelligence works in the classroom. Research indicates that teachers, even in big classrooms expect artificial intelligence to improve teaching and learning by means of digital resources and handling of various student problems (Kim & Kim, 2022). Encouragement of students' AI competency also relies on teachers' AI understanding and pedagogy (Yau et al., 2023). Good AI education calls for well-crafted frameworks that effortlessly fit AI into learning environments (Lin et al., 2022).

Evaluation accuracy has been much enhanced, so guaranteeing consistency and efficiency by means of AI integration into education. AI-powered grading systems provide objective assessments across fields by means of automated essay scoring and plagiarism detection (Luckin et al., 2016). These instruments reduce the human mistakes and biases in conventional grading. Artificial intelligence also examines student entries, points up misunderstandings, and offers quick comments to help them better before final submission (Selwyn, 2019). Notwithstanding these developments, questions persist about artificial intelligence's capacity to evaluate higher order cognitive abilities, creativity, and contextual awareness. Teachers should combine AI-assisted grading with hand review to guarantee a thorough assessment of student work since AI systems could find it difficult to reflect the subtleties of human expression (Popenici & Kerr, 2017).

5.2. Challenges and Strategies in AI Implementation

Although artificial intelligence (AI) presents great advantages for education, its acceptance creates several questions. The confidence in the technology determines most teachers' impressions and acceptance of AI-powered technologies (Nazaretsky, Ariely, Cukurova, & Alexandron, 2022). Effective artificial intelligence integration into educational environments calls for awareness of user confidence in AI-based learning systems (Qin, Li, & Yan, 2020). Effective AI application in teaching and learning depends on addressing elements impacting educators' acceptance—training, familiarity, and support systems among others (Gupta & Bhaskar, 2020).

Teachers see artificial intelligence as a useful tool for developing critical thinking and increasing assignment accuracy. AI improves the accuracy and efficiency of tests by automating processes, providing tailored learning experiences, and allowing virtual settings (Ahmad et al., 2021). To fully leverage artificial intelligence's advantages in education, nevertheless, issues with confidence, acceptance and execution must be addressed.

Though artificial intelligence (AI) has great potential for accuracy and fairness in assessments, its pragmatic use is still complicated and calls for strategic planning and enough training (Yin, Ngiam, & Teo, 2021). Lack of knowledge of strategic AI applications and the necessity of efficient implementation strategies impede practical AI use (Kitsios & Kamariotou, 2021). Overcoming these obstacles calls for human-centered strategies, effective tools, and the use of artificial intelligence features guarantee a smooth integration.

Using artificial intelligence in the classroom brings difficulties beyond its benefits including infrastructural needs, faculty development, and opposition to change. Many organizations, especially in poor areas, lack the financial means and tools required for efficient deployment of artificial intelligence (UNESCO, 2021). Resistance may also come from faculty worries about artificial intelligence substituting for conventional teaching approaches or lowering human interaction (Williamson & Piattoeva, 2020). Institutions should make investments in gradual artificial intelligence integration and capacity-building initiatives to solve these problems so that feedback guarantees ongoing development. Clearly defined policies and ethical standards will help to promote responsible artificial intelligence application in the educational sector (McGuire, 2020).

5.3. Readiness for AI Adoption in Education Assessments

Studies on teachers' institutional support and readiness for artificial intelligence (AI) use in educational

assessments expose a spectrum of opinions from neutrality to modest optimism. Effective AI integration in education mostly relies on teachers' attitudes and perspectives (Krstić, Aleksić, & Krstić, 2022). Previous research underline the requirement of customized plans to help teachers include artificial intelligence in tests since some of them show excitement while others remain cautious owing to different degrees of preparedness (Jones, 1985). Good artificial intelligence use depends on knowledge about teachers' preparedness and the supporting systems offered by their organizations.

Among the several elements influencing teachers' readiness for AI adoption in evaluations are familiarity with AI technology, anticipated advantages of AI integration, worries about job security, and institutional support. Teachers that see artificial intelligence as a tool for improving assessment accuracy, grading efficiency, and personalizing learning experiences often show greater preparedness for use. On the other hand, some teachers' reluctance and reduced readiness stem from concerns about job displacement, limited training chances, and ambiguity about artificial intelligence's influence on teaching approaches (Pedró, 2020). Successful artificial intelligence integration in educational assessments depends on addressing these issues using focused training and institutional assistance.

Teachers' willingness for the implementation of artificial intelligence in educational evaluations is shaped by institutional support. Studies show that teachers who have sufficient tools, resources, and training from their institutions are more likely to feel ready and secure in using artificial intelligence technology in their evaluation methods (Ahmad et al., 2021). Successful deployment of artificial intelligence in educational evaluations depends on institutional readiness, policy frameworks, and student adaptation. Schools that include artificial intelligence without a defined plan could find it difficult to uphold academic integrity and guarantee fair assessment (Luckin et al., 2016). Teachers have to create rules that strike a mix between artificial intelligence support and the need for autonomous student learning. Students also need to become AI literate if they are to properly negotiate AI-based tasks. Understanding how artificial intelligence creates replies, seeing biases, and applying AI-generated insights responsibly, of which all define AI literacy (Heffernan & Heffernan, 2014). Students who lack these abilities could use artificial intelligence in a way that results in academic dishonesty or over-reliance on AI-generated content. Therefore, institutional regulations should stress ethical AI use and demand students to interact with artificial intelligence as a complement rather than a main tool for project completion. This strategy guarantees that adoption of artificial intelligence improves rather than reduces students' cognitive and analytical capacity (Selwyn, 2019). Good professional development initiatives, open communication on the advantages of artificial intelligence adoption, and continuous support systems help to improve teachers' preparedness and desire to accept AI in evaluation procedures (Popenici & Kerr, 2017). Nonetheless, the variation in institutional support across various educational environments might cause differences in teachers' degree of preparedness and impede the general acceptance of artificial intelligence in tests.

Teachers, educational institutions and legislators working together will help to solve issues and advance preparation for artificial intelligence adoption in the context of AI used in evaluations (Hasan, Jaber, Khabour, & Alzoubi, 2024; Popenici & Kerr, 2017). Targeting training programs, building an innovative and experimental culture, and establishing supportive settings that enable risk-taking and learning from mistakes might be ways to help educators be more ready for artificial intelligence adoption. Furthermore, helping to create trust and confidence in AI technology among teachers is the establishment of explicit rules and frameworks for AI integration, encouragement of cooperation among stakeholders, and addressing of data privacy and ethical issues (Pedró, 2020). In essence, teachers' preparedness for the acceptance of artificial intelligence in educational evaluations ranges from neutral to quite favorable, therefore reflecting a range of opinions and impressions of AI technology. Teachers' preparedness varies depending on things like institutional support, anticipated advantages, experience with artificial intelligence, and worries about employment stability. By means of focused training, efficient communication, and supportive surroundings, addressing these elements will help teachers to be more

ready and enable the successful integration of artificial intelligence into evaluations of education (Ahmad et al., 2021).

5.4. Future Role of AI in Shaping the Educational Landscape, Particularly in Assessments and Assignments

Examining open-ended responses in this study reveals that, especially in evaluations, artificial intelligence (AI) has great power to change teaching strategies and improve learning results. Tests and tasks in educational environments should be transformed as artificial intelligence technologies advance. By providing individualized learning experiences, enhancing assessment accuracy, and encouraging critical (Owan, Abang, Idika, Etta, & Bassey, 2023), the literature indicates that integration of artificial intelligence will drive significant educational innovations. Furthermore expected to be very important in creating programmatic evaluations that maximize learning results and guarantee systematic curricular quality is artificial intelligence (Chan & Zary, 2019).

Educational institutions can give real-time comments and modify tests to fit the unique learning development of every student by means of AI-powered evaluation systems. This tailored strategy is supposed to improve academic achievement and produce more successful learning environments. Adaptive learning systems driven by artificial intelligence fit tests to student development, therefore ensuring that assessments fairly represent learning successes (Popenici & Kerr, 2017). AI teachers with real-time comments and dynamically changing task difficulty could be among future uses. Additionally enabling teachers to spot at-risk students and act quickly is predictive analytics (McGuire, 2020). Nonetheless, artificial intelligence should enhance rather than replace human-led education so that automation fits pedagogical best standards. Maintaining the integrity and quality of educational evaluations will depend on a balance between artificial intelligence-driven automation and human knowledge (UNESCO, 2021).

Alternatively, this study is similar to other studies that the contribution of artificial intelligence to educational assessments goes beyond conventional testing strategies to include creative ideas as computerized adaptive testing (CAT) (Oladele & Ndlovu, 2021). In their studies, the use of artificial intelligence in educational evaluations employing CAT has the potential to change higher education. These examples demonstrate that dynamic and adaptable assessment tools can precisely evaluate students' knowledge and abilities. Using artificial intelligence algorithms helps educational tests to be customized to every student's degree of competency, therefore enabling a more accurate assessment of their learning development. Moreover, artificial intelligence technologies are likely to transform the manner that assessments and instruction are provided, thus improving the results of education for the students (Owan et al., 2023). AI can improve the accuracy and efficiency of educational evaluations by automating repetitive chores, offering tailored learning experiences, and supporting data-driven decision-making. Large data analysis, pattern identification in student performance, and insight generation made possible by AI-powered assessment systems may guide teaching plans and interventions (Kim & Kim, 2022). Trending studies suggest that future integration of artificial intelligence in education is projected to completely change the classroom environment, teacher cooperation, and the creation of AI-based technology platforms (Ghnemat, Shaout, & Abrar, 2022). AI technology may help teachers evaluate student development, provide individualized training, and help to run classrooms. Thus, AI can liberate teachers' time to concentrate on personalized education and student assistance by automating administrative activities and offering intelligent tutoring tools (Qin et al., 2020).

Similar to the findings of this study, future educational initiatives as artificial intelligence develops will probably center on the creation of regulatory policies, competency-based courses, and creative approaches to curriculum restructuring (Charow et al., 2021). Emphasizing the need for ethical issues, patient-clinician relations, and the efficient use of AI technology in educational settings, the integration of artificial intelligence in education will call for a multidisciplinary approach to curriculum building. The future of artificial intelligence in forming the educational scene has significant potential to improve teaching methods, raise learning results, and stimulate educational innovation especially in tests and assignments. Educational institutions may design customized

learning environments, streamline evaluation systems, and equip students for success in an ever digital and data-driven environment using artificial intelligence technology. Therefore, teachers and legislators should welcome these developments and investigate the transforming possibilities of artificial intelligence in education as it keeps developing.

5.5. Ethical Considerations on the Use of AI in Education

From the perspectives of the respondents, transparency and responsibility in AI systems used for assignments and evaluation was one of the main ethical questions. Lack of openness in how artificial intelligence systems decide might result in prejudices, unjust results, and mistrust of the technology (Busch, Adams, & Bressem, 2023). Furthermore, the possibility of artificial intelligence systems producing erroneous or misleading results presents ethical questions particularly in high-stakes educational tests where precise and dependable findings are very vital (Busch et al., 2023). Protecting student data and privacy raises even another ethical question about the use of artificial intelligence in the classroom. Often depending on large volumes of student data, artificial intelligence systems tailor learning experiences and provide suggestions. Maintaining student privacy and confidence in the educational system depends on this data being managed securely, anonymized, and utilized responsibly (Hasan et al., 2024). Implementing AI technology in educational environments requires for careful thought on issues of informed permission, data ownership, and data security (Kim & Kim, 2022).

Recent studies have also shown that the ethical consequences of artificial intelligence in education go to problems of prejudice and justice. AI systems may unintentionally reinforce prejudices in the data they are taught on, therefore producing discriminating results for certain student groups (Chan & Zary, 2019). Ensuring justice and equality in the assessment of student achievement depends on addressing bias in AI systems used for educational evaluations. Furthermore, design and deployment of AI systems in education have to take justice, beneficence, and openness into account to help to lower any ethical hazards (Hasan et al., 2024). Ethical questions of artificial intelligence applied in education center on issues of academic integrity, data privacy, and algorithmic prejudice. The proliferation of AI-generated content has sparked questions over originality and plagiarism in student contributions (O'Neil, 2016). AI-powered writing aides like ChatGPT give students ordered responses, which begs issues regarding intellectual contribution and authenticity. AI-driven evaluation tools also have to guarantee fairness and inclusivity since biassed training data might lead to discriminating results (Williamson & Piattoeva, 2020). Maintaining human supervision in tests and ensuring openness in AI systems can assist to allay some ethical questions. Moreover, institutions have to enforce explicit regulations on data privacy so that AI technologies do not use academic and personal data of students (UNESCO, 2021). Using ethical artificial intelligence calls for a balance between protecting students' rights in classroom settings and technical development.

Studies have also demonstrated that teachers and education institutions may use different approaches to handle ethical issues in daily life. For example, encouraging openness in the use of AI algorithms by means of justifications of how choices are taken would assist to foster understanding and confidence among the involved parties (Franco D'Souza, Mathew, Mishra, & Surapaneni, 2024). Promoting ethical decision-making by means of ethical education for teachers, students, and parents on the ethical consequences of artificial intelligence in education and encouraging debates on responsible AI usage would help to improve awareness of ethical issues (Baskara, 2023). Clear regulations and standards for the ethical use of artificial intelligence in education, including data protection measures and bias mitigating mechanisms, may assist to guarantee that AI technologies are used responsibly and ethically (Weidener & Fischer, 2024). Furthermore, including ethical issues in AI education and training courses will educate teachers with the knowledge and tools required to negotiate ethical conundrums around AI deployment in educational environments (Akgun & Greenhow, 2022). In other examples, promoting multidisciplinary cooperation between professionals in artificial intelligence, ethics, and education will help to provide a comprehensive strategy to handling ethical issues and creating best practices for the ethical application of

artificial intelligence in education (Pierson, 2023). Teachers and institutions can negotiate the ethical complexity of artificial intelligence in education and guarantee that AI technologies are utilized responsibly and ethically by giving ethical issues top priority, supporting openness, and encouraging a culture of ethical awareness.

5.6. Transforming Student Engagement and Motivation in Assignments with AI Components

As shown in the findings, offering individualized learning experiences, instantaneous feedback, and adaptable learning paths, the integration of artificial intelligence technology in assignments has the potential to improve student involvement, motivation, and learning results. This is also supported by recent studies that AI-powered technologies may provide students with chances for engaging and dynamic learning experiences, which can boost their motivation and interest in doing homework (Watts, Dood, Shultz, & Rodriguez, 2023). Artificial intelligence integration in assignments has the power to revolutionize student involvement and motivation by means of interactive and customized learning experiences. For instance, artificial intelligence-driven gamification might bring real-time feedback, challenges, and incentives, thereby enhancing the relevance of tasks (Luckin et al., 2016). Customized AI tutors can support students' particular learning requirements and increase their drive to finish homework, hence offering quick help. Artificial intelligence techniques must enhance rather than replace the conventional teacher-student relationship to maximum involvement. Teachers could help students to develop critical thinking, foster teamwork, and inspire originality in their projects using artificial intelligence (Heffernan & Heffernan, 2014). Using artificial intelligence as a tool for improvement instead of reliance would help students acquire vital skills and keep active participation in the learning process. Well-crafted AI-based projects can result in more student autonomy and richer learning opportunities (Popenici & Kerr, 2017).

Using artificial intelligence in assignments is mostly dependent on the possibility of individualized feedback and assistance which may increase student motivation by means of customized advice and encouragement depending on individual learning requirements and development. Similar to this study's evidence, students may get immediate comments on their work, find areas for development, and participate in self-directed learning by using Artificial intelligence (AI) technology or artificial intelligence chatbots. Increased engagement with tasks results from students' confidence, motivation, and feeling of success raised by this tailored feedback (Watts et al., 2023). Other studies have also proved that by allowing students to work together on projects, exchange ideas, and provide peer criticism, artificial intelligence systems may also help to enable cooperative learning events (Roy & Khritish, 2024). In essence, AI-supported cooperative projects may help students develop their sense of community, communication skills, and cooperation by means of which a good learning environment improves motivation and participation (Hasan et al., 2024). Teachers may design projects that encourage active student involvement and engagement by using AI technologies that support communication and teamwork (Kim & Kim, 2022; Roy & Khritish, 2024). Furthermore, the use of artificial intelligence in homework presents chances for students to be creative, curious, and autonomous in their educational path. Artificial intelligence-powered applications may provide students with open-ended projects encouraging critical thinking, problem-solving, and creativity as well as difficult work and real-world challenges (Boyd, 2010).

AI-enhanced coursework may inspire students' natural curiosity, creativity, and intrinsic motivation by letting them take control of their education and investigate several points of view. When utilizing artificial intelligence in homework, ethical issues must be taken into account to guarantee that students' academic integrity, autonomy, and privacy are safeguarded (Swargiary, 2024). Hence, teachers should clearly explain how artificial intelligence is used in assignments, clear expectations about student involvement and participation, and provide direction on moral AI usage. Teachers may design projects that support ethical conduct, critical thinking, and student involvement by encouraging a culture of academic integrity, respect for other points of view, and responsible AI usage (Swargiary, 2024). By means of tailored feedback, encouragement of teamwork, creative development, and chances for independent learning, the integration of artificial intelligence in assignments has the potential to improve student

involvement and motivation (Qin et al., 2020). Therefore, teachers may design projects that encourage inquiry, foster learning, and enable students to realize their full potential in the digital age by carefully and responsibly using artificial intelligence tools.

6. IMPLICATIONS OF THE STUDY

This investigation of the mixed-method approach from the GenAI Assessment offers important new perspectives on the possibilities of artificial intelligence in educational environments particularly in regard to assessments and assignments. The results supported the various theories of technological adoption. The findings implied that while artificial intelligence improves assignment correctness and promotes critical thinking, teachers' opinions on the institutional preparedness for AI adoption and the implementation difficulties vary somewhat moderately. This suggests that issues around AI integration—training, infrastructure, and support from educational institutions should be addressed if we are to utilize the advantages of AI technology in improving educational results. Integration of artificial intelligence (AI) into learning settings is becoming crucial as it offers fresh ideas on tests and homework. The GenAI Assessment research clarifies the advantages of artificial intelligence in education by showing that it may increase assignment accuracy, encourage critical thinking, and therefore improve educational results (Chan & Zary, 2019). Although artificial intelligence could transform education by offering feedback, guiding learning paths, and lowering costs (Chan & Zary, 2019) teachers' opinions of institutional preparedness for AI adoption and the complexity of implementation is still present difficulties. Teachers' different perspective on artificial intelligence integration emphasize the importance of addressing problems like training, infrastructure and support from educational institutions to totally harness the benefits of AI technology in education (Chan & Zary, 2019).

Studies on artificial intelligence applications in education have shown that they may simplify administrative chores for teachers, so facilitating more efficient and effective evaluation and grading of assignments, so improving the quality of educational activities (Chen, Chen, & Lin, 2020). Furthermore, artificial intelligence algorithms have been identified as efficient and verified substitute for conventional scientific tests proving their potential in improving educational procedures (Kim & Kim, 2022). Emphasizing many advantages of artificial intelligence in educational environments, effective integration of AI technology in higher education has been shown to favourably affect student learning experiences, support services, and enrollment management (Hannan & Liu, 2023). In terms of practice, although artificial intelligence has many potential advantages for education, problems with teachers' confidence in AI-powered learning tools have been found. Particularly when they contradict their current knowledge of students , teachers may show confirmation bias and be hesitant to embrace AI-based suggestions (Nazaretsky et al., 2022). Emphasizing the requirement of openness and honest communication about the capabilities and constraints of AI systems, this emphasizes the need of addressing human elements influencing teachers' opinions about artificial intelligence (Nazaretsky et al., 2022). Similarly, underlining the need of establishing a suitable environment for AI integration in education, factors including institutional support, resources, and recognition significantly inspire teachers to use AI-based teaching and learning solutions (Gupta & Bhaskar, 2020).

In terms of policy implications, establishing ethical values for artificial intelligence in education can help to guarantee responsibility, justice, and autonomy in the use of AI technology (Nguyen, Ngo, Hong, Dang, & Nguyen, 2023). Adoption of artificial intelligence in education also calls for careful navigation of possible hazards such data privacy issues and prejudices to maintain educational ideals and provide fair rewards for all stakeholders (Huang, Pivithuru, & Gothami, 2024). Educational institutions may build a framework for responsible AI deployment that puts student well-being and learning results first by tackling these ethical and privacy issues (Nguyen et al., 2023).

Artificial intelligence (AI) integration into education offers a transforming possibility to improve teaching tactics, raise student learning results, and simplify administrative work. Although artificial intelligence presents

many advantages—personalized feedback, adaptable learning routes, and more accurate grading—teachers' worries about trust, ethical issues, and acceptability must be given great attention. Encouragement of institutional support, openness, and ethical standards will help educational institutions to properly negotiate these obstacles and maximize the possibilities of artificial intelligence to provide a more interesting and efficient classroom. Future studies ought to concentrate on creating models for flawless use of artificial intelligence in education. Such research could provide optimal practices for teaching teachers to apply artificial intelligence properly and investigate how various learning environments affect AI acceptability and efficacy. Further investigation should also look at how artificial intelligence affects student involvement and learning results, so offering a whole picture of its contribution to improve education.

7. CONCLUSION

The study on the integration of artificial intelligence (AI) in educational assessments exposes major advantages and difficulties for academia. AI improves assignment correctness and encourages among students' critical thinking and problem-solving ability. Still, different degrees of acceptance and preparedness among teachers highlight the need of great institutional support and customized training courses. Maximizing the benefits of artificial intelligence depends on a complete strategy that also addresses ethical issues and upholds academic integrity.

The study emphasizes the need for ongoing research and development in artificial intelligence technology to better satisfy educational goals. Future research should concentrate on developing flexible artificial intelligence systems following ethical guidelines that satisfy various educational demands. Creating such systems will not only solve present implementation issues but also open the path for more individualized and interesting learning surroundings. Policymakers, developers, and teachers working together will help to maximize AI's influence in education while preserving values of justice and privacy.

Funding: This research is supported by University of Malaya, Malaysia.
Institutional Review Board Statement: The Ethical Committee of the University of Malaya, Malaysia has granted approval for this study on 23 July 2024 (Ref. No.: UM.TNC2/UMREC_3591).
Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: Conceptualization, methodology, data collection, manuscript writing, final proofreading, Kenny S.L. Cheah (KSLC); literature review, application from institutional research ethical committee, ShanShan Tang (SST); theoretical framework development, validation, result interpretation, Janitha Kularajasingam (JK); statistical analysis, technical support, critical revisions, Manimekalai Jambulingam (MJ); visualization, formatting, final proofreading, Wen Fen Beh (WFB). All authors have read and agreed to the published version of the manuscript.

REFERENCES

Ahmad, S. F., Rahmat, M. K., Mubarik, M. S., Alam, M. M., & Hyder, S. I. (2021). Artificial intelligence and its role in education. *Sustainability, 13*(22), 12902. https://doi.org/10.3390/su132212902

Akgun, S., & Greenhow, C. (2022). Artificial intelligence in education: Addressing ethical challenges in K-12 settings. *AI and Ethics, 2*(3), 431-440. https://doi.org/10.1007/s43681-021-00096-7

Alam, A. (2021). *Should robots replace teachers? Mobilisation of AI and learning analytics in education*. Paper presented at the 2021 International Conference on Advances in Computing, Communication, and Control (ICAC3) 1-12.

Baskara, R. (2023). Personalised learning with AI: Implications for Ignatian pedagogy. *International Journal of Educational Best Practices, 7*(1), 1-16.

Benjamins, R., & Salazar, I. A. (2020). Towards a framework for understanding societal and ethical implications of artificial intelligence. *ArXiv, abs/2001.09750*.

Boyd, C. (2010). Mock webpage: An innovative assignment for second-degree nursing students. *Nursing Forum, 45*(3), 159-165.

https://doi.org/10.1111/j.1744-6198.2010.00184.x

Busch, F., Adams, L. C., & Bressem, K. K. (2023). Biomedical ethical aspects towards the implementation of artificial intelligence in medical education. *Medical Science Educator*, *33*(4), 1007-1012. https://doi.org/10.1007/s40670-023-01815-x

Chan, K. S., & Zary, N. (2019). Applications and challenges of implementing artificial intelligence in medical education: Integrative review. *JMIR Medical Education*, *5*(1), e13930. https://doi.org/10.2196/13930

Charow, R., Jeyakumar, T., Younus, S., Dolatabadi, E., Salhia, M., Al-Mouaswas, D., . . . Dhalla, A. (2021). Artificial intelligence education programs for health care professionals: Scoping review. *JMIR Medical Education*, *7*(4), e31043. https://doi.org/10.2196/31043

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278. https://doi.org/10.1109/access.2020.2988510

Chou, C.-M., Shen, T.-C., Shen, T.-C., & Shen, C.-H. (2023). The level of perceived efficacy from teachers to access AI-based teaching applications. *Research and Practice in Technology Enhanced Learning*, *18*, 021-021. https://doi.org/10.58459/rptel.2023.18021

Chounta, I.-A., Bardone, E., Raudsep, A., & Pedaste, M. (2022). Exploring teachers' perceptions of artificial intelligence as a tool to support their practice in Estonian K-12 education. *International Journal of Artificial Intelligence in Education*, *32*(3), 725-755. https://doi.org/10.1007/s40593-021-00243-5

Chowdhery, J., Jasmin, A., Jaiswal, A., & Jothi, J. A. A. (2021). *Automatic student performance prediction system using data mining techniques*. Paper presented at the 2021 International Conference on Computing and Communications Applications and Technologies (I3CAT) 57-65.

Franco D'Souza, R., Mathew, M., Mishra, V., & Surapaneni, K. M. (2024). Twelve tips for addressing ethical concerns in the implementation of artificial intelligence in medical education. *Medical Education Online*, *29*(1), 2330250. https://doi.org/10.1080/10872981.2024.2330250

Ghnemat, R., Shaout, A., & Abrar, M. (2022). Higher education transformation for artificial intelligence revolution: transformation framework. *International Journal of Emerging Technologies in Learning*, *17*(19), 224-241. https://doi.org/10.3991/ijet.v17i19.33309

Griffiths, P., & Cubric, M. (2024). EJEL editorial 2024: Special issue on AI in education: Opportunities and challenges (Parts 1 & 2). *Electronic Journal of e-Learning*, *22*(6), 82–87. https://doi.org/10.34190/ejel.22.6.3831

Gupta, K. P., & Bhaskar, P. (2020). Inhibiting and motivating factors influencing teachers' adoption of AI-based teaching and learning solutions: Prioritization using analytic hierarchy process. *Journal of Information Technology Education. Research*, *19*, 693. https://doi.org/10.28945/4640

Hannan, E., & Liu, S. (2023). AI: new source of competitiveness in higher education. *Competitiveness Review: An International Business Journal*, *33*(2), 265-279. https://doi.org/10.1108/cr-03-2021-0045

Hasan, H. E., Jaber, D., Khabour, O. F., & Alzoubi, K. H. (2024). Ethical considerations and concerns in the implementation of AI in pharmacy practice: A cross-sectional study. *BMC Medical Ethics*, *25*(1), 55. https://doi.org/10.1186/s12910-024-01062-8

Heffernan, N. T., & Heffernan, C. (2014). *The future of intelligent tutoring systems*. Paper presented at the Proceedings of the 7th International Conference on Educational Data Mining (EDM 2014).

Huang, Q., Pivithuru, J. K., & Gothami, S. J. (2024). Navigating the future: Exploring ai adoption in Chinese higher education through the lens of diffusion theory. *Interdisciplinary Journal of Information Knowledge and Management*, *19*, 9. https://doi.org/10.28945/5277

Jones, M. (1985). Applications of artificial intelligence within education. *Computers & mathematics with applications*, *11*(5), 517-526.

Jurado, R. (2023). Students' attitudes to the use of artificial intelligence. *ICERI 2023 Proceedings*, 1–6. https://doi.org/10.21125/iceri.2023.0191

Karaca, A., & Kılcan, B. (2023). The adventure of artificial intelligence technology in education: Comprehensive scientific mapping analysis. *Participatory Educational Research*, *10*(4), 144-165.

Kim, N., & Kim, M. (2022). Teacher's perceptions of using an artificial intelligence-based educational tool for scientific writing. *Frontiers in Education*, 7. https://doi.org/10.3389/feduc.2022.755914

Kitsios, F., & Kamariotou, M. (2021). Artificial intelligence and business strategy towards digital transformation: A research agenda. *Sustainability*, *13*(4), 2025. https://doi.org/10.3390/su13042025

Kousa, P., & Niemi, H. (2023). AI ethics and learning: EdTech companies' challenges and solutions. *Interactive Learning Environments*, *31*(10), 6735-6746.

Krstić, L., Aleksić, V., & Krstić, M. (2022). Artificial intelligence in education: A review. *Proceedings TIE 2022*.

Lee, O. (2018). English language proficiency standards aligned with content standards. *Educational Researcher*, *47*(5), 317–327.

Lin, H. (2022). Influences of artificial intelligence in education on teaching effectiveness: The mediating effect of teachers' perceptions of educational technology. *International Journal of Emerging Technologies in Learning (Online)*, *17*(24), 144. https://doi.org/10.3991/ijet.v17i24.36037

Lin, X.-F., Chen, L., Chan, K. K., Peng, S., Chen, X., Xie, S., . . . Hu, Q. (2022). Teachers' perceptions of teaching sustainable artificial intelligence: A design frame perspective. *Sustainability*, *14*(13), 7811. https://doi.org/10.3390/su14137811

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. Londres: Pearson.

McGuire, P. (2020). The role of artificial intelligence in higher education: Opportunities and challenges. *Journal of Educational Technology Development and Exchange*, *13*(1), 1-15.

Mudawy, A. (2024). Investigating efl faculty members' perceptions of integrating artificial intelligence applications to improve the research writing process: A case study at Majmaah university. *Open Science Framework*. https://doi.org/10.31235/osf.io/k4ub8

Nazaretsky, T., Ariely, M., Cukurova, M., & Alexandron, G. (2022). Teachers' trust in AI-powered educational technology and a professional development program to improve it. *British Journal of Educational Technology*, *53*(4), 914-931. https://doi.org/10.1111/bjet.13232

Nguyen, A., Ngo, H. N., Hong, Y., Dang, B., & Nguyen, B.-P. T. (2023). Ethical principles for artificial intelligence in education. *Education and Information Technologies*, *28*(4), 4221-4241. https://doi.org/10.1007/s10639-022-11316-w

O'Neil, C. (2016). *Weapons of math destruction: How big data increases inequality and threatens democracy*. New York: Crown Publishing Group.

Oladele, J. I., & Ndlovu, M. (2021). A review of standardised assessment development procedure and algorithms for computer adaptive testing: applications and relevance for Fourth Industrial Revolution. *International Journal of Learning, Teaching and Educational Research*, *20*(5), 1-17. https://doi.org/10.26803/ijlter.20.5.1

Owan, V. J., Abang, K. B., Idika, D. O., Etta, E. O., & Bassey, B. A. (2023). Exploring the potential of artificial intelligence tools in educational measurement and assessment. *Eurasia Journal of Mathematics, Science and Technology Education*, *19*(8), em2307. https://doi.org/10.29333/ejmste/13428

Pedró, F. (2020). Applications of Artificial Intelligence to higher education: Possibilities, evidence, and challenges. *IUL Research*, *1*(1), 61-76.

Pierson, C. M. (2023). *Supporting ethical and cultural competency development in cross-disciplinary information education in Germany*. Paper presented at the Proceedings of the ALISE Annual Conference. https://doi.org/10.21900/j.alise.2023.1312.

Popenici, S. A., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning*, *12*(1), 22. https://doi.org/10.1186/s41039-017-0062-8

Qin, F., Li, K., & Yan, J. (2020). Understanding user trust in artificial intelligence-based educational systems: Evidence from China. *British Journal of Educational Technology*, *51*(5), 1693-1710. https://doi.org/10.1111/bjet.12994

Razali, M. N., Zakariah, H., Hanapi, R., & Rahim, E. A. (2022). *Predictive model of undergraduate student grading using machine learning for learning analytics*. Paper presented at the 2022 4th International Conference on Computer Science and Technologies in Education (CSTE) 260-264. IEEE.

Roy, K., & Khritish, S. (2024). Chatgpt impact on EFL Indian undergraduates.

https://doi.org/10.20944/preprints202405.0130.v2

Selwyn, N. (2019). *Should robots replace teachers? AI and the future of education*. United Kingdom: Cambridge University Press.

Swargiary, K. (2024). Leveraging artificial intelligence for enhanced project completion in education. https://doi.org/10.21203/rs.3.rs-3462413/v2

UNESCO. (2021). *Artificial intelligence in education: Challenges and opportunities for sustainable development*. France: United Nations Educational, Scientific and Cultural Organization.

Vaithilingam, P., Zhang, T., & Glassman, E. (2022). *Expectation vs. experience: Evaluating the usability of code generation tools powered by large language models*. Paper presented at the Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (pp. 1–14). ACM.

Watts, F. M., Dood, A. J., Shultz, G. V., & Rodriguez, J.-M. G. (2023). Comparing student and generative artificial intelligence chatbot responses to organic chemistry writing-to-learn assignments. *Journal of Chemical Education*, *100*(10), 3806-3817. https://doi.org/10.1021/acs.jchemed.3c00664

Weidener, L., & Fischer, M. (2024). Proposing a principle-based approach for teaching ai ethics in medical education. *JMIR Medical Education*, *10*(1), e55368. https://doi.org/10.2196/55368

Williamson, B., & Piattoeva, N. (2020). Education governance and datafication: The role of artificial intelligence in education. *Educational Philosophy and Theory*, *52*(1), 1-12.

Woolf, B. P. (2010). *Building intelligent interactive tutors: Student-centered strategies for revolutionizing e-learning*. United States: Morgan Kaufmann.

Yau, K. W., Chai, C. S., Chiu, T. K., Meng, H., King, I., & Yam, Y. (2023). A phenomenographic approach on teacher conceptions of teaching Artificial Intelligence (AI) in K-12 schools. *Education and Information Technologies*, *28*(1), 1041-1064. https://doi.org/10.1007/s10639-022-11161-x

Yin, J., Ngiam, K. Y., & Teo, H. H. (2021). Role of artificial intelligence applications in real-life clinical practice: Systematic review. *Journal of Medical Internet Research*, *23*(4), e25759. https://doi.org/10.2196/25759

Zhao, R., Wang, H., Gao, J., & Zhang, Y. (2022). Plant volatile compound methyl benzoate is highly effective against Spodoptera frugiperda and safe to non-target organisms as an eco-friendly alternative. *Ecotoxicology and Environmental Safety*, *245*, 114101. https://doi.org/10.1016/j.ecoenv.2022.114101