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RESEARCH ARTICLE

Ethical issues in AI-Powered education in higher educational institutions, Melaka

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ABSTRACT

The integration of artificial intelligence (AI) into higher education is rapidly changing teaching, learning, and evaluation techniques. While AI provides advantages such as individualized training, adaptive evaluations, and increased administrative efficiency, it also poses serious ethical problems. This study looks at the relationship between the level of AI implementation in education (AIIE) and three key ethical dimensions in Melaka's higher education institutions, which are fairness in student assessments (FSA), student surveillance and data collection (SSDC), and teacher-student interaction (TSI). This quantitative study used structured questionnaires to collect data from lecturers and academic staff at multiple institutions in response to three research questions. Statistical study found a substantial positive association between AIIE and SSDC, implying that greater AI integration relates to increasing student surveillance and data tracking. This study also found moderate colleration between AIIE and FSA, implying that algorithmic fairness. Furthermore, the findings demonstrate a negative relationship between AI decision-making (AIDM) and TSI, showing that greater dependence on AI may reduce meaningful teacher-student involvement. These findings underscore the need for ethical frameworks to guide the responsible use of AI in Malaysian higher education. The study recommends regular algorithm audits, transparent data policies, and hybrid instructional models that preserve human-centered learning. By addressing these ethical challenges, policymakers and institutions can ensure that AI technologies support equitable and holistic educational experiences while safeguarding student rights and preserving pedagogical integrity.

Keywords: artificial intelligence in education; ethical issues in AI; AI decision making; student data collection; fairness in student assessment

1. Introduction

The use of artificial intelligence (AI) in educational settings has transformed the landscape of teaching and learning, especially in higher education institutions. AI technologies ranging from intelligent tutoring systems and predictive analytics to automated grading tools and chatbots are increasingly being integrated into educational infrastructures around the world, including in Malaysia[14]. These tools promise improved personalization, administrative efficiency, and data-driven assistance for student learning[24]. However, the rapid rise of AI in education presents concerns, particularly in ethical realms such as justice, privacy, and educators' changing roles.

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Concerns have been raised concerning the impact of AI systems on academic fairness and honesty in Malaysian higher education, notably in Melaka universities. Automated assessments and algorithm-driven grading can add or magnify bias, resulting in unequal treatment of students from varied backgrounds[30]. These concerns highlight the necessity to investigate whether the extent of AI implementation in education (AIIE) interacts significantly with fairness in student assessments (FSA), a critical dimension for preserving academic standards and equity.

Furthermore, AI-powered educational systems rely heavily on comprehensive data collecting, which often includes constant monitoring of student behavior, performance, and engagement. This raises ethical questions concerning student surveillance and data collection (SSDC), such as permission, openness, and the effectiveness of current data protection mechanisms[10]. In Malaysia, where the Personal Data Protection Act (PDPA) is constantly growing, there are concerns regarding institutional readiness to protect student privacy in AI-driven contexts[35].

Equally crucial is AI's impact on teacher-student interaction (TSI). As AI takes on duties that educators have historically handled, such as course delivery, grading, and feedback, the structure of pedagogical partnerships evolves. While AI can improve efficiency and provide fast feedback, it may also limit opportunities for genuine human engagement, which is essential for student motivation, critical thinking, and emotional development[2,28]. This calls into question the impact of AI decision-making (AIDM) on the quality and depth of teacher-student relationships in higher education.

Despite the expanding presence of artificial intelligence (AI) in Malaysian higher education, empirical study on the ethical implications of its use, particularly in terms of justice, privacy, and human interaction is minimal. As a result, the purpose of this study is to look into the relationships between AI adoption levels and three crucial ethical dimensions which is fairness in student assessment, student monitoring and data collecting, and teacher-student interaction. By focusing on Melaka's higher education institutions, this study hopes to contribute to a more ethical and contextually suitable integration of AI technology in Malaysian higher education.

1.1. Problem statement

AI integration in higher education is altering traditional pedagogical approaches by allowing for personalized learning, automated evaluations, and data-driven decision-making[14,24]. Malaysia, particularly at Melaka's higher education institutions, AI-powered solutions such as intelligent tutoring systems, learning analytics, and chatbots are rapidly being used to improve teaching and learning efficiency. However, the rapid digital revolution presents serious ethical questions about fairness in student assessments, privacy in data collecting and surveillance, and the changing dynamics of teacher-student relationships[47].

One critical concern is fairness in student assessments (FSA). AI-based grading systems and automated evaluations might propagate algorithmic prejudice, resulting in unequal treatment of students from different backgrounds, especially marginalized groups[30]. When AI tools are taught on biased or non-representative data, they may give results that unfairly favor some student groups. This shows how important it is to find out if more AI use threatens assessment fairness[32].

Simultaneously, student surveillance and data collection (SSDC) adds an additional layer of ethical complication. AI systems frequently rely on massive volumes of student data to work properly, prompting concerns about data ownership, informed consent, and compliance with privacy laws like Malaysia's Personal Data Protection Act[35]. Without strong data governance frameworks, institutions may be subject to improper data use, surveillance overreach, and student confidentiality breaches[10].

Furthermore, the broad implementation of AI affects teacher-student interaction (TSI). AI-powered learning platforms can increase productivity and deliver quick feedback, but they may limit opportunities for meaningful interpersonal interaction. Overreliance on automated systems may limit the teacher's role in mentoring and emotional support, potentially leading to passive learning and decreased critical thinking skills in students[2,28]. As AI systems mediate more educational processes, it is critical to investigate how these technologies influence relational and pedagogical dynamics in the classroom[51].

Given these interconnected ethical concerns, the purpose of this study is to investigate the relationships between the level of AI implementation in education (AIIE) and three key dimensions which is fairness in student assessment (RQ1), student surveillance and data collection (RQ2), and teacher-student interaction (RQ3) in Melaka's higher education institutions. Understanding these relationships can help to build ethical principles and institutional methods to ensure that AI adoption in education is fair, transparent, and student-focused.

1.2. Research objective

RO1 To examine the relationship between the level of AI implementation in education (AIIE) and fairness in student assessments (FSA) in higher institutions in Melaka.

RO2 To analyse the impact of AI implementation in education (AIIE) and student surveillance and data collection (SSDC) in higher institutions in Melaka.

RO3 To examine the significant between AI decision-making (AIDM) and Teacher student interaction (TSI) in higher education institutions in Melaka.

1.3. Research questions

The following three research questions were formulated for this study:

RQ1 Is there a significant relationship between the level of AI implementation in education (AIIE) and fairness in student assessments (FSA) in higher institutions in Melaka?

RQ2 Is there a significant relationship between the level of AI implementation in education (AIIE) and student surveillance and data collection (SSDC) in higher institutions in Melaka?

RQ3 Is there a significant relationship between AI decision-making (AIDM) and teacher-student interaction (TSI) in higher education institutions in Melaka?

2. Literature review

This study is grounded in the Ethical Decision-Making Model (Rest, 1986) to analyze the ethical implications of AI in education. Moral awareness (recognizing biases), moral judgment (evaluating data privacy policies), moral intent (determining surveillance limits), and moral action (implementing ethical AI practices) are essential components in addressing these ethical challenges[31]. Education players may improve fairness, privacy, and trust inside AI-powered learning environments by including responsible artificial intelligence approaches. In the context of education, artificial intelligence decision-making is the application of artificial intelligence to automate many facets of the discipline, including admissions procedures, grading, and individualized learning.

Under national digital transformation projects, artificial intelligence (AI) integration into education is becoming more and more important in Malaysia. Adoption of artificial intelligence (AI) is supported by the Malaysia Digital Economy Blueprint (MyDGI) and the Education 4.0 framework both to increase the efficiency of educational institutions and better learning results (Ministry of education Malaysia, 2021). Personalizing education, doing automated evaluations, and offering data-driven insights for educational

policy-making using artificial intelligence is being done. AI-powered platforms as KPM Digital Learning, Edmodo, and Smart Tutor are used to evaluate student performance, suggest learning resources, and vary course pace depending on personal need[18]. Furthermore, sites like Quipper and Ruangguru use machine learning to recommend corrective actions, therefore addressing particular shortcomings of the trainees.

2.1. AI decision making

2.1.1. How is AI supporting in decision making

Through process simplification and real-time, data-driven insights, artificial intelligence greatly helps in educational decision-making. Using systems like Turnitin and MyExamo, which evaluate grammar, plagiarism, and content quality, Malaysian educational institutions use artificial intelligence to grade student essays, tests, and assignments[41].

These solutions not only lightens teachers' responsibilities but also provide consistency in assessments. In universities including Universiti Malaya and UKM, where algorithms assess academic history, extracurricular involvement, and socioeconomic backgrounds to forecast student performance and allocate resources, AI is also used in student enrolment and scholarship choosing procedures[18]. Early identification of kids who could require intervention, tracking attendance and involvement to guarantee timely tutoring and counselling, and AI are also applied in this regard[50].

2.1.2. Ethical challenges

The use of artificial intelligence (AI) in educational decision-making raises ethical issues, notably regarding teacher–student interaction. As universities use AI for grading, academic advising, and student support, the human element of education may be lost. An important issue is the decline of human-cantered pedagogy. AI decision-making may limit teacher–student interaction when AI systems take over educator tasks. Selwyn (2019) argues that automation can create a depersonalized learning environment that isolates pupils, eroding relational trust and support.

AI-driven systems lack transparency and accountability, another major challenge. Teachers may struggle to explain or defend opaque algorithm-based student decisions like performance assessments or resource allocations. Lack of transparency can lower student confidence in the system and instructors[47] .

Algorithmic bias can also affect AI systems, reflecting previous data inequalities. This can unfairly punish marginalized pupils like non-native English speakers and low-income students. Teachers traditionally advocated and interpreted context to reduce bias. AI-driven processes without human oversight can worsen inequities and limit students' recourse and individualized help[51].

Increased educational decision-making automation can hurt teacher autonomy and morale. Teachers may feel marginalized as AI systems evaluate and instruct. This lowers job satisfaction and diminishes teacher-student empathy[14]. AI can improve decision-making, but it must be implemented properly to protect teacher–student ethics.

2.2. AI Application in Education

2.2.1. How is artificial intelligence supports in education

Implementing artificial intelligence in Malaysian education is complex and improves administrative as well as teaching systems. By means of material distribution based on individual student performance, AI technologies include adaptive learning systems and automated grading tools personalize learning. This helps teachers find learning gaps, increases student involvement, and promotes differentiated instruction[22]. Offering real-time feedback and performance metrics, platforms as Frog VLE, Google Classroom, and KPM Digital

Learning are rapidly embraced to support blended and remote learning[35]. AI also assists university-level education, where colleges use plagiarism detection tools and automated essay scoring systems to maintain academic integrity and expedite evaluation[13].

2.2.2. Ethical challenges

Notwithstanding these advantages, the application of artificial intelligence in the classroom begs ethical questions. One of the main concerns is data privacy, especially with reference to the usage and gathering of private student records. Large volumes of data needed for AI systems to operate effectively raise the danger of breaches, illegal access, and misuse[19].

Still another major issue is algorithmic prejudice. If training data is lacking diversity, AI grading systems could support discrimination against students from underrepresented language or cultural groups[22].

A further urgent issue is the digital divide. Lack of the internet and digital tools required to gain from AI-enhanced education typically results from students in rural or low-income backgrounds perhaps aggravating already existing inequities[11]. These difficulties highlight the importance of fair access, open algorithms, and strong data security policies in the implementation of artificial intelligence.

2.3. AI Surveillance

2.3.1. How is artificial intelligence supports in surveillance

Artificial intelligence is becoming more common in Malaysian educational institutions. It is helping to keep students safe, support the monitoring of their academic progress, and improve daily operations through smarter data collection. Schools monitor student movement and guarantee safety by means of AI-powered attendance tracking systems comprising facial recognition technology and RFID cards[8]. These technologies help with discipline enforcement, time management, and attendance recording automation.

By examining body language and facial expressions, AI-powered CCTV and behavior analysis tools assist to identify bullying, disturbances, and emotional pain[41]. Providing actionable data for teachers, AI-based Learning Management Systems (LMS) such as Google Classroom and Frog VLE track student involvement, test results, and participation[29]. Universities such as UM and UKM also use predictive analytics to spot students at danger of emotional problems or academic failing, so enabling early intervention[35].

2.3.2. Ethical challenges

The increasing application of artificial intelligence in surveillance raises major ethical questions, especially with relation to student autonomy, consent, and psychological well-being[39]. Students' privacy can be violated and a culture of continuous surveillance created by the gathering and analysis of biometric data such as facial recognition and emotional tracking by means of which one can violate. The consciousness of being monitored could cause students to feel under pressure to act in specific ways, therefore causing tension, anxiety, and changes in natural behavior[20]. Additionally dubious is the accuracy of emotion-detection artificial intelligence since misreading of student expressions could lead to erroneous presumptions and unsuitable treatments[1].

Moreover, the ownership of data is unknown, weather that belongs to the student, the institution, or the AI service provider which raises questions regarding informed permission and data usage for unanticipated reasons, like marketing or illegal research[39,46,47]. These problems call for robust data governance systems and ethical rules to strike a compromise between innovation and student rights protection.

3. Methodology

3.1. Research Design

This study used a quantitative research approach to look into the ethical implications of AI-powered education, focusing on four important areas, which are (i) fairness in student assessments, (ii) student surveillance and (iii) data collection concerns, and (iv) teacher-student connection and trust. A correlational technique was used to investigate the linkages between these variables. A survey-based methodology was used to collect empirical data from educators at higher education institutions in Melaka, Malaysia.

3.2. Populations and samples

The target population included educators from Melaka's three higher education institutions. A random sample procedure was used to assure representativeness. A sample size of 100 responders was selected from an expected population of 300 academics. This sample size corresponds to Cohen's (1992) recommendation for identifying moderate effect sizes ($r = 0.3$), with a statistical power of 0.80 and an alpha level of 0.05.

3.3. Data collecting instrument

The study used a simple and structured questionnaire made up of six sections. Section A gathered basic demographic details, while Sections B to F explored the key areas of AI implementation, AI decision making, AI surveillance and data collection, fairness in student assessment, and teacher student trust. There were twenty five items in total, each answered on a five-point Likert scale from strongly disagree to strongly agree. The questionnaire was shared online through Google Forms so that participants could respond easily and comfortably, and on average it took about ten minutes for them to complete all the questions.

3.4. Source of questionnaire items

The questionnaire items were based on validated constructs and instruments from prior peer-reviewed studies on AI ethics in education. Items related to AI decision-making were sourced from[5,17]. The statements assessing AI implementation and personalization were adopted from[24,40,51]. The part on AI surveillance and data collecting was based on[36,47,52] investigations provided constructs for measuring fairness and equity in AI assessment. Ismail, et. al. and Zeide, E. [18,53] provided guidance on student data privacy problems. Finally, the section on teacher-student trust and interaction referred to[14,24,37].

All items were modified to align with the educational context in Malaysia and were reviewed for clarity and relevance during a pilot study. The 5-point Likert scale was used consistently across all sections to ensure ease of interpretation and comparability of responses. The full list of items, along with their sources, is provided in Appendix I.

3.5. Reliability and validity

Before the full-scale data collecting, a pilot test was carried out with 30 educators from Melaka's higher education institutions to guarantee the study instrument's dependability. The pilot study's objective was to assess the internal consistency of the questionnaire items used to gauge the following important constructs: teacher-student interaction (TSI), student surveillance and data collection (SSDC), fairness in student assessments (FSA), and the degree of AI implementation in education (AIIE).

Cronbach's alpha coefficient was used to evaluate each construct's dependability. The findings showed that all constructs had Cronbach's alpha values over 0.70, suggesting that the instrument had a respectable degree of internal consistency and reliability. These results validated the validity and suitability of the questionnaire items for the primary data gathering stage. Appendix II contains the comprehensive findings of the pilot test, including the Cronbach's alpha values for every variable.

3.6. Data collection procedure

The questionnaire was delivered electronically via email and institutional communication channels. Participants were informed of the research aims and their rights as responders. Prior to participating in the survey, participants provided informed consent. The poll stayed accessible for three weeks, giving respondents plenty of time to complete it. All collected data was anonymised to protect participant anonymity and privacy.

3.7. Data analysis techniques

The data was evaluated with both descriptive (Appendix III) and inferential statistics. Pearson's correlation coefficient was employed in inferential analysis to assess the degree and direction of correlations between the independent factors (AI implementation and AI decision-making) and the dependent variables (fairness, student surveillance and data collection, and teacher student-trust). To investigate predictive correlations, a multiple regression analysis was used. Statistical significance was determined with a p-value of less than 0.01. This technique allowed for a thorough knowledge of how AI implementation in education influences ethical outcomes.

3.8. Ethical considerations

This study adhered to accepted ethical research principles. Participants were informed about the study's goal, and participation was voluntary. The confidentiality of all responses was preserved, and no personally identifiable information was collected. The necessary institutional authorities gave ethical clearance prior to data collection.

The Higher Education institution of the researcher has reviewed the study and granted ethical approval, assuring that every step of the research is carried out with care and responsibility. This approval reflects our commitment to protecting the well being, dignity, and privacy of everyone who takes part.

4. Findings and discussion

Research Question 1: Is there a significant relationship between the level of AI implementation in education (AIIE) and fairness in student assessments (FSA) in higher institutions in Melaka?

Refer to **Table 1**, the study found a moderate positive correlation between AI implementation in education and perceived fairness of student assessments ($r = 0.536$, $p < 0.01$). This shows that as artificial intelligence becomes more common in Melaka's higher education settings, educators feel that evaluation methods are becoming fairer and less biased. It also supports the research question on the ethical impact of AI, especially its role in improving fairness in educational assessments from the educators' point of view.

This finding is supported by growing research showing that AI systems can, to a large extent, help reduce subjective bias in grading and assessment. Automated essay scoring (AES) systems, such as Turnitin and MyExamo, score student work using predetermined algorithms that stress grammar, structure, and topic relevance, reducing the unpredictability that human assessors frequently add. Ab Rahman, et al. and Baker[1,6] suggest that automation can promote fairness by applying consistent criteria to all students, establishing procedural justice in education.

Furthermore, Luckin, R., et al.[24] claims that AI-driven evaluation systems provide consistent feedback and clear rubrics, allowing students to better comprehend performance requirements and learning objectives. In this sense, AI improves distributive fairness by ensuring that students feel treated equally regardless of their background, language competence, or prior accomplishment.

However, these advantages are not without risk. Eynon, R.[11] caution that if AI systems are not adequately regulated, they can introduce new forms of algorithmic prejudice. Delello, J. A., et al. [8] also emphasize the

significance of having human oversight in AI grading systems to compensate for potential errors, especially in areas where nuance and cultural context are critical.

Additionally, research from foreign contexts has indicated that students perceive AI-enhanced grading to be more transparent and less prone to partiality, particularly when it is accompanied by options for appeal or review[27,40]. This view promotes trust in institutional decision-making, which is critical for upholding ethical norms in higher education.

The multiple regression analysis in **Table 2** aimed to examine whether AI in decision-making (AIDME) and AI implementation in education (AIIE) significantly predict students' perceptions of fairness in student assessment (FSA) in higher education institutions. The results revealed that AIIE is a statistically significant predictor of FSA, with a standardized Beta value of 0.464 and a p-value less than .001. This suggests a strong, positive relationship, indicating that greater implementation of AI tools and systems in educational settings such as automated grading, plagiarism detection software like Turnitin, and intelligent tutoring systems correlates with increased perceptions of fairness in assessment among students. This finding supports earlier research which posits that automation in educational assessment can enhance transparency and reduce human bias, contributing to a more equitable evaluation process[12,15,41].

In contrast, the variable AIDME, which refers to the broader use of AI for institutional decision-making such as admissions, resource allocation, or identifying at-risk students—did not significantly predict perceptions of fair assessment (Beta = 0.130, p = .207). Although AIDME may improve institutional efficiency and data-driven intervention[1], it appears not to influence students' direct experiences of assessment fairness, possibly due to its less visible role in day-to-day classroom interactions. This aligns with the perspective of[46], who argue that students are more responsive to AI applications that directly affect their learning and assessment experiences rather than those focused on administrative or systemic decisions.

Research Question 2: Is there a significant relationship between the level of AI implementation in education (AIIE) and student surveillance and data collection (SSDC) in higher institutions in Melaka?

Finding in **Table 1**, Pearson correlation analysis found a significant positive correlation between AI implementation in education (AIIE) and student surveillance and data collecting (SSDC) in Melaka's higher education institutions ($r = 0.634$, $p < 0.01$). This finding suggest that the more AI is integrated into educational processes and infrastructures, the more likely institutions are to embrace student surveillance and data gathering methods. This contributes to the research topic by confirming that AI integration in Malaysian higher education not only improves pedagogical and administrative processes, but also increases the usage of technology that monitor student behaviors and personal data.

This significant connection can be read in terms of how AI technology function in educational settings. AI-powered systems such as facial recognition for attendance, predictive analytics to track student performance, and emotion-detection tools included in Learning Management Systems (LMS) all necessitate the ongoing collection of student data[8,29]. For example, universities such as Universiti Malaya (UM) and Universiti Kebangsaan Malaysia (UKM) have used such systems to forecast student dropout rates and mental health difficulties based on behavioral and academic data patterns[35]. These systems frequently work in combination with institutional attempts to improve academic support, but they also raise concerns about excessive surveillance and the erosion of student privacy.

Furthermore, previous study has shown that AI's integration into educational ecosystems is strongly reliant on data. As AI techniques are used to track engagement, attendance, emotional states, and even social connections, institutions acquire more control over student behavior, often with the goal of increasing safety

or academic achievement[12,53]. This control, however, may have unforeseen ethical implications, such as psychological stress, limited autonomy, and questionable data ownership.

The correlation identified in this study is consistent with global trends. For example, Binns, R., et al.[6] and Akgun, S.[3] found that institutions employing advanced AI systems frequently increase their surveillance infrastructure as a byproduct, transforming data collecting from a technological requirement to an institutional standard. In Southeast Asia, the push for digitization has hastened the integration of AI and surveillance methods in education[13].

While the strong correlation affirms that AI enables richer and more comprehensive student monitoring, it also underscores the urgent need for ethical guidelines, including informed consent, transparency in data usage, and student rights protection[46]. Without these protections, greater AI implementation may undermine confidence between students and institutions.

The multiple regression analysis in **Table 3** was conducted to examines the predictive power of AI decision-making in education (AIDME) and AI implementation in education (AIIE) on student surveillance and data collection (SSDC) in higher education institutions.

The standardized Beta coefficient for AIIE is 0.733 with a B value of 0.665 and a standard error of 0.084. This is a strong positive relationship, indicating that increased implementation of AI in education strongly predicts greater levels of student surveillance and data collection. In other words, the more AI tools and systems are used in higher education (e.g., facial recognition for attendance, LMS analytics, CCTV with behavior tracking), the more students perceive themselves to be under surveillance. Given the large Beta value (0.733), this variable is the strongest predictor in the model.

These findings are consistent with previous literature. For example, Delello, J. A., et al.[8] and Rahman, N. A., et al. [35] observed that AI surveillance tools, such as RFID attendance systems and emotion-recognition CCTVs, are increasingly used in Malaysian universities, raising concerns about continuous monitoring. Eynon, R.[11] also noted that while AI increases institutional efficiency, it may compromise student autonomy and privacy, supporting the significance of this relationship.

Research Question 3: Is there a significant relationship between AI decision-making (AIDM) and Teacher student interaction (TSI) in higher education institutions in Melaka?

The Pearson correlation in **Table 1**, between AI decision-making in education (AIDME) and teacher-student interaction (TSI) found a weak negative connection ($r = -0.178$) that was not statistically significant ($p = 0.074$). This suggests that there is no significant association between the extent of AI involvement in institutional decision-making and the quality or frequency of teacher-student interactions in Melaka's higher education institutions.

This finding implies that incorporating AI into decision-making processes like grading, admissions, and course allocation has no direct impact on how teachers engage with students. While some may expect AI to improve or impede communication between educators and students, this finding highlights a gap between institutional-level automation and the interpersonal dynamics of teaching and learning. This is consistent with previous research demonstrating that AI tools are frequently implemented at the administrative or policy levels, and their impact may not be immediately apparent in the pedagogical or relational components of education[15,24].

Several factors could explain this insignificant connection. First, AI decision-making systems often work in the background, making high-level decisions (e.g., early warning alerts, resource allocations, course suggestions) without directly involving teachers or students[11]. Teachers may not completely comprehend or

trust these decisions, so they continue to rely on traditional judgment for classroom interactions. This may limit the degree to which AI tools impact or alter the dynamics of teacher-student engagement[34].

Second, in many Malaysian institutions, AI technologies are still in their early phases of adoption, particularly in areas that affect relational teaching characteristics. According to[8] while AI tools are increasingly being used to track attendance and academic achievement, their integration into teaching approaches that need empathy, mentorship, and discourse is restricted. This lack of integration could explain why the perceived quality of teacher-student interaction does not change considerably with the application of AI in institutional choices.

Furthermore, ethical concerns about transparency and trust in AI decision-making may lead to educator opposition. If AI judgments are viewed as opaque or lacking in human context, teachers may choose not to include them into their teaching practices[46]. This is aligned with the findings of[42] who discovered that teachers frequently regard AI as a tool for administrative support rather than an aid in developing relational or emotional bonds with students.

The multiple regression analysis was conducted to examine how AI decision-making in education (AIDME) and AI implementation in education (AIIE) affect teacher–student interaction (TSI) in higher education.

Refer to **Table 4**, the Beta coefficient for AIDME is -0.489 (B = -0.675, $p < .001$). This indicates a strong negative relationship between AI decision-making and teacher–student interaction. In simple terms, when educational decisions such as grading, feedback, and resource allocation are automated by AI, it may reduce meaningful interaction between teachers and students. This finding supports concerns that over-reliance on AI can depersonalize learning experiences and weaken human connections in classrooms[15,47].

In contrast, the Beta coefficient for AIIE is 0.556 (B = 0.644, $p < .001$), indicating a strong positive relationship between overall AI implementation and TSI. This suggests that when AI is used more broadly in education (such as through learning management systems, AI tutors, or classroom support tools), it can actually enhance interaction between teachers and students. For example, AI can free up teachers' time from administrative tasks and help them focus on student engagement, as noted by[51].

Table 1. Correlation Analysis.

Correlations						
		AIIE	**AIDME**	**FESA**	**SSDC**	**TSI**
AIIE	Pearson Correlation	1	.559**	.536**	.634**	.283**
	Sig. (2-tailed)		<.001	<.001	<.001	.004
	N	101	101	101	101	101
AIDME	Pearson Correlation	.559**	1	.389**	.233*	-.178
	Sig. (2-tailed)	<.001		<.001	.019	.074
	N	101	101	101	101	101
FESA	Pearson Correlation	.536**	.389**	1	.682**	-.060
	Sig. (2-tailed)	<.001	<.001		<.001	.554
	N	101	101	101	101	101
SSDC	Pearson Correlation	.634**	.233*	.682**	1	.336**
	Sig. (2-tailed)	<.001	.019	<.001		<.001
	N	101	101	101	101	101
TSI	Pearson Correlation	.283**	-.178	-.060	.336**	1

Correlations						
		AIIE	**AIDME**	**FESA**	**SSDC**	**TSI**
	Sig. (2-tailed)	.004	.074	.554	<.001	
	N	101	101	101	101	101

**. Correlation is significant at the 0.01 level (2-tailed).

Table 1. (*Continued*)

Table 2. Multiple regression analysis (Fairness in student data assessment).

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	6.451	1.907		3.383	.001
	AIDME	.165	.130	.130	1.271	.207
	AIIE	.496	.109	.464	4.548	<.001

a. Dependent Variable: FSA

Table 3. Multiple regression analysis (Student surveillance and data collection).

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	10.768	1.467		7.341	<.001
	AIDME	-.191	.100	-.177	-1.909	.059
	AIIE	.665	.084	.733	7.925	<.001

a. Dependent Variable: SSDC

Table 4. Multiple regression analysis (Teacher student interaction).

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	19.221	2.143		8.970	<.001
	AIDME	-.675	.146	-.489	-4.621	<.001
	AIIE	.644	.123	.556	5.251	<.001

a. Dependent Variable: TSI

5. Limitation of the study

While this study sheds light on the ethical issues of AI in higher education, it is not without limits. First, the study's scope encompasses many AI dimensions, including installation, decision-making, and surveillance, all inside a single inquiry. Although topically arranged, this breadth may have limited the amount of investigation into each variable. Future research could focus on individual AI features, such as surveillance or fairness in assessment, to allow for more in-depth qualitative or longitudinal analyses.

6. Conclusion

This study sets out to explore how AI is shaping the ethical and practical realities of higher education in Melaka. In line with the first objective, the findings showed a clear and statistically significant positive relationship between AI integration in education and students' perceptions of fairness in assessment. This

indicates that when tools such as automated grading systems and plagiarism detectors are used responsibly, students tend to view the assessment process as more consistent and impartial. It highlights the potential of AI to strengthen procedural justice and minimize academic bias in daily teaching practice.

For the second objective, the study revealed a strong positive relationship between AI integration and student surveillance and data collection. Regression analysis further confirmed that AI-driven practices significantly predict the level of monitoring in higher education settings. While AI enables more personalized learning and greater efficiency, it also raises important ethical concerns about privacy, data ownership, and the boundaries of monitoring. These findings point to the urgent need for clear, transparent, and student-centred guidelines to ensure that technological advancement does not compromise individual rights.

With regard to the third objective, the study examined the relationship between AI decision-making and teacher–student interaction. Although the correlation analysis showed no significant association, the regression results revealed that AI decision-making does influence teacher–student dynamics. This implies that excessive automation may reduce personal connection, even as broader AI implementation appears to enhance engagement in some areas. These insights echo existing literature, reminding educators that technology should support human interaction, not replace it.

Overall, the findings help us see how AI is reshaping fairness, privacy, and human relationships in higher education. While AI offers meaningful benefits for justice and efficiency, its use must be guided by ethical care, trust, and respect for the human dimension of learning. At the same time, the study acknowledges that its sample was limited to three universities in Melaka, which may affect how far the results can be generalized across Malaysia. Including institutions from different regions and classifications would enrich future studies.

There are still many meaningful areas that deserve further exploration. Since this study relied only on self-reported perceptions through structured questionnaires, future research could include interviews, focus groups, or even classroom observations to capture deeper and more personal insights into trust, privacy, and fairness.

As AI continues to grow and change, there is also value in conducting long-term studies that follow institutions over several years. This would help us understand how attitudes, practices, and ethical considerations evolve as universities move from early adoption to more mature and confident use of AI. Such work can offer a clearer picture of how technology can remain ethical, inclusive, and truly centred on people.

There are also ethical questions that need closer attention. One important area is whether institutions should monitor students' mental health data using AI. Another is what happens when students at risk are identified, and whether the support given is timely and meaningful. Future studies should also look at whether institutions have the right infrastructure, trained staff, and clear protocols to handle such situations responsibly. Reflecting on these issues will help ensure that AI does not unintentionally harm student well being or trust, but instead contributes to a safer and more caring learning environment.

As we look ahead, the real challenge is to welcome the benefits of artificial intelligence while holding firmly to the values that make education truly human. With thoughtful practice and responsible innovation, AI can become a tool that not only improves learning but also strengthens trust, fairness, and care across our institutions.

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Conflict of interest

The authors declare no conflict of interest.

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