A Perspective on Generative AI, Critical Thinking, And Responsible Digital Citizenship in Malaysian Higher Education: A Review of Challenges and Opportunities

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DOI: https://doi.org/10.47772/IJRISS.2026.100900909

Received: 07 October 2026; Accepted: 12 October 2026; Published: 27 October 2026

ABSTRACT

Generative AI (GenAI) has come as a storm that transformed the education eco system all over the world in reshaping teaching, learning, test, assessment and creating knowledge. Malaysia is not spared. While it raised alarms on academic integrity, critical thinking and responsible digital citizenship among students, lecturers and stakeholders, the adoption of GenAI becomes a necessity. It brought significant opportunities as well in innovation, personalized learning and digital transformation. This review paper explores the relationship between GenAI, critical thinking and digital transformation within the context of Malaysian higher education. The 3 interconnected areas focused on this paper are the impact of GenAI on critical thinking and analytical reasoning, the development of responsible digital citizenship and the ethical challenges associated with AI-driven learning, including plagiarism, misinformation, algorithmic bias and cognitive overreliance. This paper further argues that while GenAI enhances learning autonomy, creativity and productivity, excessive dependence on AI tools may weaken independent reasoning, reflective inquiry and intellectual accountability. The governments initiatives to provide opportunities to cultivate AI literacy, ethical awareness and critical engagement become a long and exhausting efforts as new AI enabled applications keep inundating the education market. This paper concludes that a balanced integration of GenAI supported by robust digital citizenship, education and critical thinking development are essential for preparing our graduates who are competent, ethically responsible and live in the AI-driven world.

Keywords: Generative AI, Digital Citizenship, Critical Thinking, AI-driven learning, Ethical awareness

INTRODUCTION

The complete overhaul in higher education in areas such as teaching, learning, assessments and grading is the result or impact of the introduction of Generative Artificial Intelligence (GenAI).

Malaysia is not spared. Malaysian universities started integrating it into their curriculum which has rekindled the student's mindset on creating pictures, animations, assignments and thesis papers into an advanced level of outcome which, at times, cannot be identified as AI generated. Students have embraced it immediately as it leverages an unforeseeable paradox from the traditional approach. This onset of AI creates new opportunities which accelerates innovation and speeds up in adopting digital world into the student's daily routine. However, the ethical aspects of critical thinking and responsible digital citizenship remain unanswered till today as plagiarism becomes rampant and differentiating from original to copied becomes evidently impossible.

The netizens argue that using GenAI in excess will erode the importance of practicing intellectual virtues, individual critical thinking, creativity and efficiency in problem solving and deep analytical aspects among students. Crucial skills such as ethical conduct, digital literacy, privacy awareness and respectful online interaction are slowly grinding down to a halt and dependence on the AI is increasing. These apprehensions have been identified by the Malaysian higher education institutions already. However, higher education institutions

have already realized that preparing students to adopt the connect to AI by upholding social responsibility as well as making them technically savvy is a daunting task.

Hence this research envisages to weigh the current dilemma in embracing the ever-evolving AI while trying to find answers on how to integrate into our universities' curriculum with futuristic mindset.

BACKGROUND OF STUDY

To position Malaysia a regional leader in acquiring and using AI, Malaysia created a policy called National Artificial Intelligence Framework (NAIF)- (*Malaysian Digital Economy Corporation, 2021*). It aims to boost Malaysian economy to advance in all areas of AI for a futuristic development as the country realized that AI could transform many sectors such as healthcare, education and creative industries. A string of policies therefore developed such as National AI Office under the Ministry of Digital to accelerate the need for R&D, talent cultivation and ethical AI practices. The ministry would coordinate R&D, plan and implement with emphasis on innovation, ethical governance and talent cultivation (MyDIGITAL Corporation, 2024).

The National AI Roadmap (*AI-Rmap 2021-2025*), and a newer / upcoming AI Technology Action Plan 2026-2030 has identified priority sectors to enforce AI in their daily activities and include the integration of generative AI among use cases, such as healthcare, agriculture, education etc. (National AI Office, n.d.).

To operationalize Generative AI, the government rolled out AI at Work 2.0, a program to equip around 445,000 civil servants with Google Workspace + Gemini generative AI tools with training (The Star, 2025). The aim is to free up time for strategic tasks by improving public service delivery, improving productivity, and reducing menial or repetitive tasks. Budget allocations are made in 2025 budget for R&D, high-value activities in AI, Robotics/IoT. The government also introduced Online Safety Act (ONSA) in 2024 which requires labels for online content such as

"AI-generated", "AI-enhanced" for social media content, to address misinformation, deepfake risks, identify fraud etc. (Malay Mail, 2025).

The spread of Covid-19 has made us give greater importance on developing critical thinking skills, promoting ethical digital conduct among the young generation. Thus, in hybrid mode, the authenticity of the materials produced by students need to undergo stringent scrutiny to ascertain the originality. This pushes all institutions of higher education to bring right balance between leveraging Artificial Intelligence and producing outputs morally and responsibly. The institutions of higher education have already started finding ways to instill integrity, responsibility and ethical consciousness among Malaysian university students to thrive an academic and professional environment that is increasingly shaped by AI.

Increased reliance on AI challenges traditional thinking and academic integrity.

Computer scientist John McCarthy was the first one to use the term Artificial Intelligence (AI) (Russel & Norvig, 2021). AI saw huge advancement during the 1990s and 2000s due to the advancement achieved in computing power and the introduction of blockchain technology. Blockchain technology has brought a multitude of technologies and revolutionized the computing world with Cryptocurrencies, Smart Contracts, dApps, DeFi, Non-Fungible Tokens (NFTs), Decentralized Autonomous Organizations (DAOs), Web3 and Distributed Storage Networks. All these technologies led to the spread of AI. Thus, AI has become an integral part of many sectors.

Students' and educators' perceptions influence how effectively universities cultivate responsible digital habits.

The students and educators both experience thrilling opportunities to submit their work, as the AI can summarize deep papers, create splendid outlines, and even troubleshoot complex formulas and equations in seconds. Despite the benefits of AI, the education pundits start worrying about "What happened to our own thinking when we rely upon AI for outsourcing so much of the intellectual heavy lifting?" Both educators and students have, however,

started to notice the habits of academic rigor—reading, reflection, argumentation, and many more activities connected to subjects are slipping away (Cotton et al., 2023).

The construct of academic thinking is based on friction, which is built on connecting ideas and formulating assumptions which loops till we arrive at a clarity. This process takes its own time and effort. AI simplifies this process and smooths out that friction in a shorter period. Though it is hastening productivity, Zawacki-Richter observed that it turns us into passive consumers of synthesized knowledge rather than thinkers or active meaning-makers (Zawacki-Richter et al., 2022). The necessity of cognitive growth, focused by traditional education, is completely side-lined thus becoming an attribute to decline in cognitive development.

Academic integrity comes next. All education institutions heavily rely on ethics or honor codes and citation norms, which have been blurred by AI between assistance and authorship. The question is if a student uses a large language model to generate an assignment with splendid arguments and replies or results, who owns the intellectual labor? The student or the AI? Kohnke, L., Moorhouse, B. L., & Zou, D., observed that the real challenge is to redefine what counts as original work in an era of human and machine cognition that are increasingly intertwined rather than updating policies of ethics (Kohnke et al., 2024). Without clear ethical frameworks, both educators and learners risk losing sight of what education is fundamentally about: the cultivation of authentic voice and intellectual accountability (Amdan et al., 2024).

After the above argument, banning AI will come in handy. However, banning technology innovation is not the solution. We need to create assessment models that can segregate value over product and a classroom that enforces more hands-on dialog, revision, and critical interrogation of AI outputs. Academic integrity can be preserved if higher education institutions enforce changes which suit the needs as reiterated by Perkins et al., 2025.

Lack of Empirical Focus on How Malaysian University Stakeholders Perceive These Developments

The adoption and governance of AI in Malaysia's education ecosystem have been influenced by cultural norms which manifest in shaping the country's digital transformation agenda (Yusoff et al., 2023). The enthusiasm of lecturers and educators to push AI literacy among students and in their assessment, approaches have at times marginalized outright restrictions as often the students regard GenAI tools as legitimate cognitive support (Lim & Aziz, 2024).

The absence of notable empirical research on how technological and pedagogical developments in higher education perceived by stakeholders within Malaysian universities has remained unexplored. The current studies only focus on policy frameworks, technological infrastructure, the marketing strategies and delivery of courses. Therefore, the current research in this area is having a limited insight into how stakeholders interpret and respond to educational innovations with the Malaysian higher education context.

Stakeholder engagement is a decisive factor in the successful acceptance and adoption of educational innovations. Involving key groups—students, academics, administrators, and policymakers—directly shapes institutional change, promotes sustainability, and ensures educational advancement. As Bryson (2018) argues, engaging stakeholders is essential for building support, addressing concerns, and adapting new technologies to improve education quality.

Critical Thinking in the AI Era: Definitions and Conceptual Models

As Lau et al., defined that Critical Thinking in AI era is "reasonable, reflective thinking focused on deciding what to believe or do when interacting with AI systems" (Lau et al., 2025). Lau et al., further describes a **Three-Factor Verification Model** which conceptualizes the AI use as comprising verification, motivation (dispositional tendency to evaluate), and reflection (considering broader implications).

This idea further extends foundational definitions of critical thinking as "self-guided, self-disciplined thinking which attempts to reason at the highest level of quality in a fair-minded way" (Foundation for Critical Thinking, 2024), adding AI-specific verification and evaluation dimensions.

The **Dual-effect Model,** as described by Gonsalves (Gonsalves, 2024), insists that AI simultaneously enhances and challenges critical thinking across cognitive, affective and metacognitive domains. Though AI can support lower-order cognitive skills, over-reliance on AI can potentially diminishes independent analytical abilities (Essien et al., 2024).

Zhang & Wang, in the **Integration Model**, frames critical thinking as "purposeful evaluative and self-regulated process that must be preserved despite increasing reliance on AI tools (Zhang & Wang, 2025). This model insists that AI should augment rather than replace human judgement, requiring learners to analyze, evaluate, synthesize and create via independent reasoning (Chen et al., 2022).

Analytical and Evaluation Reasoning – Challenges and Opportunities

The two important aspects of evaluating GenAI are Analytical skills and Evaluation reasoning which help students to verify accuracy, maintain intellectual integrity and autonomy of the content produced by AI (Artificial Intelligence). This would further elevate the social standards and higher education ecosystems as contents that are fake and without critical evaluation inundate the Net.

Challenges: The reliance on AI tools have affected the students' critical thinking skills and high-order thinking skills of our university students in terms of digital security. It is noted that very few universities have developed policies for governing AI use, thus leading to unregulated adoption of AI which subsequently, affect their progress in ethical practice while using GenAI (UNESCO, 2023). This is obviously true to the local scenario as well and efforts taken both by government and local higher education institutions prove to be very little and ineffective. According to Banu (Banu et al., 2025), student perceptions prioritize functionality over content credibility, indicating insufficient evaluation reasoning.

Opportunities: No higher education institution can leave AI behind without integrating into their curriculum as it offers personalized learning, improved content delivery for both students and instructors and helps streamline administrative processes when properly scaffolded. Malaysian students report high digital citizenship skills in online wellbeing and learning (Mahdadir Naidu, 2021). Uniten's Fasih Digital Initiatives under 2027 curriculum aims to embed responsible digital citizenship, merging technical skills with ethical behavior (Uniten,2024). Thus, it becomes obvious that the three-factor verification model need to be implemented into every higher education institution across Malaysia such as comprising verification, motivation and reflection which bring critical evaluation to all AI outputs. This would develop analytical reasoning with AI literacy among Malaysian graduates and make them responsible digital citizens.

Importance of Analytical and Evaluative Reasoning

Analytical and Evaluative Reasoning has been our main protection against passively accepting whatever one can accept from any AI machines. As the learning environment is flooded with AI-generated content, it becomes an important issue to segregate information using our analytical skills. It is to note that AI chatbots often work by predicting patterns in data and not by knowing the meaning or truth. It is obvious that the results from an AI generated information may consist of biases, reflect social inequalities, or even confidently present made-up facts – often called "hallucinations" (do Amara, 2026; Wani & Ahmad, 2026). The possibility of believing whatever biased information provided by the AI bots is higher among student populations which can weaken the quality of their academic work. As Lee (Lee, 2025) reiterates that the role of human intelligences shifted that we ac more as overseers and stewards of AI output. This argument further insists on using our analytical and evaluating skills on information we receive using AI chatbots. As our tasks become more easier using AI, contextual judgement, awareness of social and political issues and ethical decision making will truly affect our professional success in long-term (Ahmad & Nazil, 2026). Building strong analytical reasoning ensures that AI serves as a tool that expands our thinking, rather than replacing deep understanding with automation.

3.3 Risks of Overreliance on AI

Cognitive offloading is a term used to describe when students hand over basic mental work like brainstorming,

synthesizing information or drafting initial ideas as they want to skip mental struggle (Kelly & Burkel, 2025; Lodge & Hong, 2026). Students, using AI, tend to produce polished work while their actual abilities are overshadowed and their own quality declines due course of time. According to Siti Kausar Zakaria (Siti Kausar Zakaria, 2025), "the overdependence increases integrity problems but may also delay the growth of crucial skills like critical and creative thinking and problem-solving skill, thus decreasing employability that Malaysian graduates must have". Thus, students lose their independent reflection and critical thought as the AI tools are likely to engage in more of these areas. Mental fatigued students often rely on AI tools to solve their academic problems without challenging the excerpts given by the AI. As a result, assignments submitted are homogenized in terms of both appearance, sound and patterns (Cordero et al., 2025). This attitude slowly erodes their ability to critically analyse content and leaving students unprepared for challenges posed by life without the assistance of AI.

1. Responsible Digital Citizenship

As we are entangled into nearly every part of our lives, being a digital citizen is important than just following some basic internet principles. Modern scholars define digital citizenship as the way we thoughtfully, safely, and authentically participate in society through our online actions (Brummer, 2025). As we are aware that the society has slowly get into the ethical guidelines of AI and rules of how we live and interact. The human side of the digital behaviour as of today has not only focusing on technical skills but also on ethical behaviour. It rests on 3 mail pillars: treating others with respect, understanding how digital systems work and actively protecting our data (Sulaiman et al., 2025).

The centre of this framework is five closely connected practices:

1. Digital Ethics:
- Setting standards for kindness and good behaviour
2. Privacy:
- Taking responsibility for our digital footprint
3. Media Literacy:
- Critically evaluate the information algorithms feed us, verify where data comes from, and spot deceptive content like deepfakes (Georgopoulou et al., 2025).
4. Online Respect:
- Keep online communities emotionally safe and supportive
5. Cyber Accountability:
- To ensure we protect both private and public information from being exploited by algorithms.

4.1 Role of Higher Education in Fostering Digital Responsibility

As an emerging economy, Malaysia plays a vital role in shaping digital responsibility converting students from passive consumers into ethical digital citizens. Higher education institutions (HEIs) in Malaysia play a major role in devising policies to integrate digital literacy and cyber ethics into foundational curriculum across the nation. Programs emphasize critical media literacy, teaching to evaluate algorithm-driven information, verify data sources, and identify deceptive content like deepfake (Abdullah & Rahman, 2023). This approach helps students understand the societal impact of their digital footprint.

HEIs of Malaysia should foster digital responsibility through experiential learning and proactive campus policies. Some universities such as Universiti Malaya and Universiti Kebangsaan Malaysia became front-runners in promoting cyber accountability through student-led digital citizenship campaigns and robust anti-cyberbullying frameworks (Tan, Lim & Wong, 2024). The other universities soon will follow suit in encouraging learners to actively come forward to safeguard their communal data assets against algorithmic exploitation. This would undoubtedly be transformed and provided students with practical exposure to real-world data privacy standards when strategic academia-industry collaborations are taken forward.

THE INTERSECTION OF GENERATIVE AI, CRITICAL THINKING AND DIGITAL CITIZENSHIP

Reshaping Learning Autonomy, Creativity and Information Integrity

The contemporary educational landscape has been jolted by the introduction of Generative AI with its new possibilities for knowledge creation technique which affected personalized learning and digital engagement. Generative AI offers seamless access to students who find it rather easier and quicker in acquiring information, developing ideas and interacting with digital environments. This newly found digital wealth of conducting and solving their perennial problems such as assessments, final exams and Projects have been easily and quickly solved relatively faster in terms of collecting information and finalizing them. However, they failed to realize that the transformative potential of GenAI extends beyond the technological environment, innovation field, but highly intersecting with critical thinking and digital citizenship. So, their learning autonomy, creativity and information integrity are highly influenced by GenAI and ultimately, simply making them to highly depend on GenAI by depleting their cognitive skills.

The first and foremost notable outcome of GenAI integration into education is the decrement of learning autonomy. The immediate access provided by the GenAI tools have made the students addicted to it not bothering about the ethics and critical thinking decline. According to UNESCO (2023), generative AI can support personalized educational pathways by adapting content to individual learner needs and preferences. The excessive reliance on AI-generated outcomes undermines independent reasoning and problem-solving abilities. Therefore, critical thinking serves as a necessary safeguard, empowering students to evaluate the accuracy, relevance, and reliability of AI-generated content rather than accepting it uncritically (Paul & Elder, 2020).

Humans developed creativity and critical thinking ever since they existed on the earth. The onset of Generative AI has taken over this aspect thus reducing the thinking and analysing abilities of us. The dilemma is that on the one hand AI tools can enhance creativity by facilitating brainstorming, content generation, on the other hand, it diminishes the human ability to excel in creativity and critical thinking. Concerns have emerged regarding the potential homogenization of thought and the reduction of original intellectual effect when AI-generated content substitutes rather than complements human creativity (Luckin, 2024). This urges higher education institutions to promote critical engagement with AI tools, ensuring that creativity remains a collaborative process between humans and AI than passive consumption of AI generated contents.

Another critical dimension offered by the information integrity at the intersection of GenAI is critical thinking and digital citizenship. As the sophistication of AI generated text, images and multimedia elements has increased the concerns on deepfakes, misinformation and the negligence of trust in digital information ecosystems. Digital citizenship requires individuals to use technology responsibly, ethically, and transparently while respecting principles of accuracy, accountability, and intellectual honesty (Ribble, 2022). Critical thinking, in this context, becomes highly indispensable for double checking sources, identifying biases and segregating true source of information from fabricated content. Developing this competency in segregating true source from fabricated content becomes one of the main skills during this AI era.

Generative AI has already started to reshape the learning autonomy, creativity and information integrity in profound ways. The benefits of this aspect in our education environment can only be fully realized when it is associated with critical thinking skills and responsible digital citizenship practices by using the unprecedented opportunities provided by the GenAI. Therefore, it becomes necessary for higher education institutions to embrace these competencies to inculcate into students' minds preparing them for ethical, informed and autonomous participation in an AI-driven society.

Ethical Challenges: Plagiarism, Misinformation and Bias

Ethical challenges came along with GenAI usage as a side effect, thus plunging the academic integrity into chaos and systemic complications. The leading challenge is to define plagiarism; the ease of generating authentic-sounding prose obfuscates clear boundaries of true authorship and challenges traditional, retrospective academic

misconduct tracking (Lund, 2025). This further intensified by information fabrication, such as algorithmic hallucinations and false data generations, which corrupt the factual baseline necessary for sound research (Minocha, 2026).

With the widespread availability of online resources and growing academic demands, plagiarism has emerged as a major issue in Malaysian higher learning institutions. It is the act of passing off someone else's thoughts, words, or creations as one's own without giving proper credit. Due to studies, undergraduate plagiarism may be a result of things like a shortage of comprehension about correct citation techniques, weak academic writing abilities, time constraints, and pressure to perform well academically. Opportunities for both deliberate and inadvertent plagiarism have expanded due to the accessibility of obtaining material over the internet.

DISCUSSION AND ANALYSIS

Cognitive and Ethical Mechanics of GenAI Adoption

It started with a jolting as higher education in Malaysia embraces GenAI. However, the government intervention makes slow progress into more meaningful by implementing laws of governance of GenAI with a delicate balance on digital ethics and critical thinking. As we are aware, that inclusion of GenAI fundamentally reconfigures human information processing, introducing a phenomenon known as “Cognitive Offloading” (Ninghardjanti, 2025). The successful adoption of the ever-expanding technological capabilities of GenAI depends not only on the technical performance but also on cognitive and ethical mechanisms that shape user acceptance, trust and responsibility.

The cognitive theories of technology acceptance insist that students are more likely to support AI systems as they are perceived as beneficial and reliable, though the later aspect is disputed. However, extreme reliance on GenAI may push us into a phenomenon called “Automation Bias”, where students accept AI-Generated content without any question and sufficient verification. The weaking critical thinking aspects among students and its adverse effects such as foster a false sense of mastery in educational settings where AI-generated outputs may replace active learning process.

Stakeholder perceptions: Divergence and Tension

Though the concept of Artificial Intelligence has been there since the early 1950s, the introduction of modern Generative AI is launched when OpenAI publicly released ChatGPT on November 30, 2022. This event has triggered the availability of generative AI tools in the market which has transformed the way we do computing. Students are the ones who immediately embraced it and made it so popular on the academic side by prioritizing its capacity for immediate personal feedback, teal-time explanation and rapid task execution (Change 2026; Pallant, 2025). However, this enthusiasm has completely underestimated or undermined the ethical aspects of using AI. A significant part of the students admit that they are overtly reliant on automated platforms for coursework thus, less than 10% of students prioritize structure data training using AI as empirical evidence cites. This has been the intense concern for university lecturers and instructors who scramble to find a balance to pedagogical utility against evaluation security as it is seen by both lecturers and other stakeholders as an unavoidable socio-economic catalyst. The digital modernization proposed by the policy makers is still in a preliminary stage, but their optimal focus is to include technology without disturbing the traditional way of teaching. The lecturers demand regulatory protection, and assessment validity becomes an institutional tension as students demand swift, frictionless access to digital tools.

Pedagogical, Policy and Governance Implications

GenAI has the potential to support personalized learning, improve student engagement and facilitate adaptive educational experiences. Students use AI tools for brainstorming, creating assignments, summarizing literature and opting immediate feedback. Educators employ GenAI to design learning materials, generate assessment questions, even marking assessments and automating administrative tasks thereby ultimately improving efficiency (McDonald et al., 2024).

However, the widespread availability of GenAI challenges traditional assessment practices. Conventional assignments that primarily assess content production may no longer accurately measure student learning when AI-generated outputs can be easily incorporated into coursework.

Meanwhile, the urgency on Malaysian universities is to redesign assessments which enforces critical thinking, problem solving, reflection and authentic learning experiences. As it is evident that world universities already started adopting assessment models that are resilient to AI assistance, including oral examinations, project-based learning and portfolio assessments. The governing bodies worldwide are already forcing universities to make digital literacy as a core competency in their curriculum. The necessity currently is to inculcate not only to understand and use AI tools but also to evaluate AI generated information critically, identifying biases and understanding ethical implications among students.

Socio-Cultural Dynamics within the Malaysian Educational Context

The heavily debated topics in Southeast Asia during this time are the intersection of socio-cultural dynamics and the educational context. As it is evident that Malaysia is a multi-ethnic, multi-religious and multilingual society – comprising primarily the Malay/Bumiputera majority alongside significant Chinese and Indian minorities and other numerous indigenous groups.' In Malaysian education ecosystem, education is primarily viewed as a vehicle for nation building, social mobility and cultural transmission, our education system is deeply intertwined with the country's socio-cultural fault lines.

AI Integration in Malaysian Universities and the Attitudes of Students from Multicultural Backgrounds Towards AI

The integration of AI in Malaysian universities has accelerated in recent years due to the rapid advancement of digital technologies and the growing demand for Industry 4.0 skills. Universities are incorporating AI into curricula to improve student engagement, facilitate adaptive learning, and develop graduates who are prepared for an AI-driven workforce (Das et al., 2024). Research indicates that Malaysian students generally perceive AI as useful for academic tasks such as information retrieval, content generation, language assistance, and problem-solving (Mizan & Norman, 2024). These benefits contribute to positive attitudes toward AI adoption among university students.

Students from multicultural backgrounds often exhibit varying perceptions of AI based on their educational experiences, language proficiency, and cultural values. In Malaysia's diverse university environment, AI tools can support intercultural communication by overcoming language barriers and facilitating collaboration among students from different ethnic and linguistic groups (Sarwari et al., 2024). Such capabilities are particularly valuable in multicultural classrooms where effective communication is essential for academic success.

Despite the advantages, concerns regarding AI usage remain prevalent among students. Many students worry about the accuracy, credibility, and ethical implications of AI-generated content (Yusoff et al., 2025). Academic integrity is another significant concern, as excessive reliance on AI may reduce critical thinking skills and encourage plagiarism. Studies have found that students appreciate the convenience of AI tools but also recognize the importance of maintaining human judgment and ethical responsibility when using them (Mazaheriyan & Nourbakhsh, 2025).

Cultural diversity also influences students' acceptance of AI. Students who are more technologically exposed or come from educational backgrounds that encourage innovation tend to demonstrate higher levels of AI acceptance. Conversely, some students may be more cautious due to concerns about privacy, bias, or the potential replacement of human interaction in learning environments (Deng et al., 2025). Nevertheless, the overall trend suggests that Malaysian university students view AI positively when appropriate guidance and institutional support are provided.

In conclusion, AI integration in Malaysian universities is reshaping higher education by enhancing learning experiences and preparing students for future careers. While students from multicultural backgrounds generally hold positive attitudes toward AI, their perceptions are influenced by cultural values, educational experiences,

and ethical considerations. Universities should therefore promote AI literacy, responsible usage, and inclusive policies to ensure that all students can benefit from AI technologies effectively and equitably.

RECOMMENDATIONS

To push forward, Malaysian universities need to accelerate a coordinated multi-stakeholder approach is necessary to swiftly navigate through socio-cultural complexities of AI integration.

1.1 For Universities and Educators

As Tan & Lee reiterated that Malaysian Universities must proactively embed AI ethics, digital literacy and critical thinking modules into both general studies and specific disciplinary courses (Tan & Lee, 2023). This will further ascertain students do not simply consume technology but actively interrogate socio-cultural and ethical implications. This in-turn urges educators to master AI-enhanced pedagogy thus moving away from just using the basic tools to transformative and student-centered teaching methods (Rahman et al., 2024).

1.2 For Students

Universities should empower the students to be active and responsible digital citizens by including ethical awareness into their curriculum. Institutions should promote awareness of responsible AI use through training, workshops and campus-wide campaigns that demystify algorithmic bias, plagiarism and data privacy (Chong, 2022). Meanwhile, curricula should integrate reflective assessments that require students to engage in critical evaluation rather than merely reproducing AI-generated information. All assessments must have the students to analyze, question, and assess by validating, relevance and ethical implications of the information generated by AI tools.

Furthermore, the assessments should enforce students to justify their opinions, compare difference perspectives and reflect their learning process. All universities are already on the path of promoting higher-order thinking skills (HOTS) and this would further enhance the students' critical thinking skills. This would foster metacognition and accountability in an era where generative AI can easily obscure the line between legitimate assistance and academic dishonesty (Lim & Abdullah, 2024).

1.3 For Policymakers

A nationwide framework for AI literacy in education should be established to ensure that equitable access to all and standardized guidelines for ethical use across public and private institutions. The government support by granting funds to research AI-ethics and pedagogical innovation would be a greater necessity at this time. Crucially, this funding must prioritize research that addresses the unique multi-ethnic, multilingual and multi-religious context of Malaysia, ensuring that AI policies are culturally responsive and mitigate existing digital divides (Aziz & Singh, 2025). The student and educator perceptions on critical thinking and digital ethics are an important factor in the era of AI. The need to identify the balanced integration of technology that helps the stakeholders to enhance their knowledge and understanding of AI rather than replace humans is a paramount factor to move forward with this technology. By leveraging their socio-economic and socio-cultural landscapes as a testing ground for inventing ways to uphold inclusive and ethical AI frameworks, Malaysian universities can lead and cultivate a generation of graduates who are not only technologically proficient but also ethically grounded, ensuing that AI serves as a catalyst for equitable and holistic education environment.

SUMMARY OF KEY FINDINGS: THE ROLE OF PERCEPTIONS

The one thing that is proved beyond doubt is that technology expansion cannot be evaluated in isolation from human psychology. This is evident from the rapid deployment of GenAI across the education sector and the innumerous unoriginal assessments submitted by both students as well as the instructors. As it is seen that the AI launch and its adverse effects on assessments and content creation have been faked and finding original becomes a Himalayan task, however advanced software used to segregate original from fake.

Strategic Pathways for Malaysian Higher Education Leadership

By leveraging national policy directives, such as the Malaysian Digital Education Policy and the Higher Education Plan, the nation's universities have a historic opportunity to move away from reactive, punitive compliance structures toward proactive digital leadership (Chang, 2025). To achieve this, universities should pursue a dual-track strategy:

- First, universities should establish and enforce a comprehensive institutional policy and governance framework for AI usage.
  - The guidelines should clearly indicate the acceptable and unacceptable uses of GenAI in coursework, research and assessments.
  - Mandatory disclosure of AI assistance in academic submissions can help maintain academic integrity while allowing students to benefit from emerging technologies (UNESCO, 2023) to maintain transparency.
- Second, there is a need for redesigning assessment practices by the institutions of higher education, to become more transparent to AI-generated content.
  - As take-home essays present vulnerabilities to misuse, alternative assessments such as oral examinations, reflective journals, project-based learning, portfolios and authentic real-word problem- solving tasks can be assigned (Quince et al., 2025). It would help shifting focus from content to critical thinking, creativity and application of knowledge.
- Third, investing in AI literacy is another important aspect of eradicating duplication for universities.
  - Students should be educated on the benefits of GenAI rather than relying on detection and punishments.
  - Professional development programs should be created by the faculty to integrate AI effectively into teaching and assessment practices.
- Fourth, Malaysian universities should strengthen technological and academic support systems.
  - To identify misconduct due to reliability concern (Wang, et al., 2023), universities should not rely upon AI-detection tools alone but to combine technology with academic mentoring, formative feedback and continuous assessment to promote authentic learning.

Malaysian higher education leadership should move beyond a punitive approach toward a strategic framework that integrates policy development, assessment transformation, AI literacy, and institutional capacity building. By fostering responsible AI use rather than outright prohibition, universities can uphold academic integrity while preparing graduates for an AI-driven future.

ACKNOWLEDGMENT

The authors thank UNITAR International University for the support of the publication of this research.

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