NAVIGATING THE LEGAL AND ETHICAL CHALLENGES OF AI-DRIVEN ICT UTILIZATION IN HIGHER EDUCATION

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Abstract

This paper explores the challenges and implications of Information and Communication Technology (ICT) utilization among higher education students, with a focus on its intersection with legal frameworks governing data privacy, cybersecurity, and ethical considerations. As artificial intelligence (AI) and advanced technologies become integral to educational platforms, students face significant hurdles, including inadequate digital literacy, unequal access to technology, and concerns over data security. These challenges are compounded by the rapid evolution of AI-driven tools, which often outpaces existing legal regulations, creating gaps in compliance and ethical oversight. The study examines how these issues impact students' academic performance and their ability to engage with technology-driven learning environments. It also analyses the legal implications of ICT misuse, such as breaches of personal data and intellectual property violations, within the context of higher education institutions. By drawing on case studies and recent regulatory developments, the paper highlights the need for robust legal frameworks that address cybersecurity risks and promote equitable access to technology. Furthermore, it explores the ethical dilemmas arising from AI applications in education, such as algorithmic bias and surveillance concerns, and their potential to undermine student autonomy. The paper proposes recommendations for policymakers and educational institutions to foster a balanced integration of ICT, ensuring compliance with data privacy laws like General Data Protection Regulation (GDPR) and enhancing digital inclusivity. By addressing these challenges, the study aims to contribute to a deeper understanding of how technology reshapes the legal landscape in higher

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education, advocating for reforms that align innovation with ethical and legal standards to enhance access to justice and educational equity.

Introduction

The advent of advanced technologies has dramatically reshaped the landscape of higher education, with digital tools and Artificial Intelligence driven Information and Communication Technology (hereinafter referred as AI-driven ICT) platforms becoming integral to modern academic institutions. Digital transformation has transformed the dimensions of learning in terms of accessibility, efficiency and engagement, but it has also thrown up the emergent challenge of a growing digital divide among students from lower-income backgrounds. As in Malaysia, students from Bottom 40% (hereinafter referred as B40) income group tend to find it difficult accessing digital resources, getting sufficient and reliable internet connectivity and having the technological devices deemed necessary to keep up with their learning requirements.[1]

This paper addresses the challenges arising from the use of AI-driven ICT in higher education, particularly as it affects students' learning experiences and academic outcomes. These challenges are especially pressing in contexts particularly among students from the B40 income group.[2] To provide a structured understanding, the paper begins by outlining the technological background and adoption of AI-driven ICT in academic environments. It then identifies key challenges faced by students, particularly in terms of access, data security and dependence on AI systems. The legal implications of AI in education are explored next, focusing on issues such as personal data breaches, intellectual property rights and compliance with frameworks like the **General Data Protection Regulation** (hereinafter referred as GDPR). This is followed by an analysis of the ethical considerations surrounding AI applications examining the impact of these technologies on student performance and educational equity, illustrated through relevant case studies.

Background On AI-Driven ICT in Education

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[1] MCII, 'What Is the B40 Student Experience after 6 Months of MCO? MCII Speaks to the Malaysian Reserve' <https://mcii.org.my/2020/11/16/what-is-the-b40-student-experience-after-6-months-of-mco-mcii-speaks-to-the-malaysian-reserve/> accessed on 10 June 2025.

[2] Nor Samsiah Sani, Ahmad Fikri Mohamed Nafuri, Zulaiha Ali Othman, Mohd Zakree Ahmad Nazri, and Khairul Nadiyah Mohamad, 'Drop-Out Prediction in Higher Education Among B40 Students' (2020) 11(11) International Journal of Advanced Computer Science and Applications 550.

What is ICT? ICT refers to a broad range of technological tools and platforms used to communicate, create and manage information. In the context of education, it includes adaptive learning platforms, predictive analytics and intelligent virtual assistants.[3] The integration of AI into ICT has significantly expanded its role in higher education. AI-driven ICT tools can tailor content to individual learning styles, automate administrative and grading processes, facilitate virtual classrooms and support remote and hybrid learning environments. These technologies enable greater flexibility, increased engagement and more personalized academic experiences, making education easier to access.

In higher education, ICT serves as the foundation for modern academic environments involving Learning Management System (hereinafter referred as LMS) like Moodle and Blackboard, virtual classrooms such as Zoom and Microsoft Teams, facilitating everything from digital libraries and online course materials.[4] For instance, universities such as Taylors University and Sunway University have now adopted hybrid learning systems that allow students to attend lectures in person or listen to recorded sessions over the Internet for greater flexibility in learning.[5] Additionally, Google Scholar and online journal repositories such as ScienceDirect and Journal Storage (hereinafter referred as JSTOR) permit students to access an enormous pool of academic resources from anywhere, thus decreasing their dependency on physical libraries; hence, enabling a leaning model that go beyond traditional classroom settings. These innovations contribute to more efficient management of academic workflows and facilitate a better learning experience, gradually becoming an essential component of educational infrastructure where knowledge is delivered in an easier way and introducing to a new era of education landscape.

Indeed, ICT has created inroads for learners to further enrich their self-learning and improvement initiatives. Through Massive Open Online Courses (hereinafter referred as MOOCs) at Coursera, edX or Udemy, learners now have the chance to learn from some of the top institutions across the globe. For example, a student studying business in Malaysia can enroll himself into a digital marketing course made available by Harvard University on Coursera to advance his knowledge beyond the curriculum. Online Codecademy websites and

[3] Abid Haleem, Mohd Javaid, Mohd Asim Qadri, Rajiv Suman, 'Understanding the role of digital technologies in education' (2002) 3 Sustainable Operations and Computers 275-285.

[4] Cameron Hashemi-Pour, 'What is a learning management system (LMS)?' (*Tech Target*, 22 Oct 2024) <https://www.techtarget.com/searchcio/definition/learning-management-system> accessed on 10 March 2025.

[5] 'E-learning and Innovation' (*Taylor's University*) <https://university.taylors.edu.my/en/discover-us/innovation-in-teaching-and-learning/e-learning-and-innovation.html> accessed on 11 March 2025.

free programs like R and Python[6] allow the student to polish his technical skills to suit the job market.[7]

Key Challenges of AI-Driven ICT for Students

Several major problems regarding the ICT utilization among higher education students, especially in Malaysia, have raised public concerns.[8] As AI becomes deeply embedded in educational infrastructures, it raises significant concerns particularly due to the lack of adequate regulatory oversight.[9] The collection and processing of large volumes of student data raises concerns about privacy, surveillance and data security where AI-driven tools tend to replace manual work. For instance, during remote learning and examinations, monitoring tools such as AI-based proctoring software can intrude into students' private spaces, raising serious privacy concerns and potential legal violations.[10] A notable legal framework which is relevant in this context is the **GDPR**.[11] It is a comprehensive data protection law implemented by the European Union where it governs how personal data should be collected, stored and processed, emphasizing transparency as well as accountability. Whereas, Malaysia is governed by the **Personal Data Protection Act 2010** (hereinafter referred as PDPA 2010) where it assists in regulating the law in handling personal information responsibly and securely.[12]

Being AI-powered, it assumes that all students have equal access to reliable internet and modern digital devices. In reality, students from lower-income backgrounds or rural areas such as those from Malaysia's B40 income group may struggle to meet these basic requirements, thereby deepening educational inequality.[13] Questions surrounding disparities in technology access create educational inequities have sparked critical debate as it limits the full

[6] Javier Canales Luna, 'Phyton vs R for Data Science: Which should you learn?' (*Data Camp*, 28 Dec 2022) <https://www.datacamp.com/blog/python-vs-r-for-data-science-whats-the-difference> accessed on 10 March 2025.
[7] Soumya Kanti, '10 Best Codecademy Alternatives in 2025' <https://www.geeksforgeeks.org/best-codecademy-alternatives/> accessed on 10 March 2025.
[8] Bernard Marr, 'The 15 Biggest Risks Of Artificial Intelligence' (*Forbes*, 2 Jun 2023) <https://www.forbes.com/sites/bernardmarr/2023/06/02/the-15-biggest-risks-of-artificial-intelligence/> accessed on 10 July 2025.
[9] 'Artificial Intelligence (AI): Disruptions or Opportunities' (*MIDA*) <https://www.mida.gov.my/artificial-intelligence-ai-disruptions-or-opportunities/> accessed on 10 July 2025.
[10] Noor Akbari, 'Online Proctoring With AI: The Issues and Solutions' (*Rosalyn*, 22 Feb 2024) <https://www.rosalyn.ai/blog/online-proctoring-with-ai-the-issues-and-solutions> accessed on 10 July 2025.
[11] Ben Wolford, 'What Is GDPR, the EU's New Data Protection Law?' (*GDPR.EU*) <https://gdpr.eu/what-is-gdpr/> accessed on 10 July 2025.
[12] Kherk Ying Chew and Serene Kan 'Malaysia: Personal Data Protection (Amendment) Act 2024 to Come into Force' (*Baker McKenzie InsightPlus,* 27 Dec 2024) <https://insightplus.bakermckenzie.com/bm/data-technology/malaysia-personal-data-protection-amendment-act-2024-to-come-into-force> accessed on 10 July 2025.
[13] A. Devisakti, Muhammad Muftahu and Hu Xiaoling, 'Digital divide among B40 students in Malaysian higher education institutions' (2022) Education and Information Technologies <https://link.springer.com/article/10.1007/s10639-023-11847-w> accessed on 10 July 2025

participation of students in digital learning environments. To address these challenges requires significant investments in technology infrastructure which is not realistic at this moment.[14]

In recent years, students have increasingly made use of AI tools such as ChatGPT, DeepSeek, Grammarly and other intelligent writing or problem-solving systems to assist with their academic work.[15] These valuable learning aids help students to understand complex topics, improve their writing and even generate ideas; however, they also raise concerns about academic integrity. Some students may use these tools not merely for support but to complete assignments entirely or to gain an unfair advantage during assessments.[16] While AI has been widely recognized for its capacity to advance higher education through innovation and efficiency, its application also presents notable limitations and risks that cannot be overlooked.

An over-reliance on AI tools have the potential to undermine essential educational goals by discouraging active engagement with course material. When students depend on AI to generate responses or complete assignments, they may miss out on developing key cognitive skills such as critical thinking, creativity, analytical reasoning and independent problem-solving.[17] These are core competencies that higher education aims to cultivate and excessive dependence on AI can hinder long-term academic growth and intellectual maturity.[18]

In addition, the integration of AI systems into educational settings without adequate human oversight introduces the risk of unintended consequences and errors. AI systems operate based on patterns and data especially with the data but they lack the contextual understanding and ethical reasoning that humans originally possess. For example, an AI grading system may misinterpret nuanced student responses, penalize creativity or fail to recognize plagiarism effectively.[19] Without proper monitoring and critical review by humans, these automated

[14] Alita Sharon, 'Malaysia Budget 2025: Digitalisation, AI Growth and Startup Ecosystem' (*OpenGov*, 21 Oct 2024) <https://archive.opengovasia.com/2024/10/21/malaysia-budget-2025-digitalisation-ai-growth-and-startup-ecosystem/?c=my> accessed on 10 July 2025.
[15] Tom Sanders, 'Nearly 400 Caught Using ChatGPT to Plagiarise Uni Assignments' (*Metro*, 5 Jul 2023) <https://metro.co.uk/2023/07/05/nearly-400-caught-using-chatgpt-to-plagiarise-uni-assignments-19075163/> accessed on 10 July 2025.
[16] Arianna Prothero, 'New Data Reveal How Many Students Are Using AI to Cheat' (*Education Week*, 25 Apr 2024) <https://www.edweek.org/technology/new-data-reveal-how-many-students-are-using-ai-to-cheat/2024/04> accessed on 10 July 2025.
[17] Chunpeng Zhai, Santoso Wibowo, Lily D.Li 'The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review' (2024) 11(28) Smart Learning Environments <https://slejournal.springeropen.com/articles/10.1186/s40561-024-00316-7> accessed on 10 July 2025.
[18] Ben Moore, 'I Used AI to Cheat at Uni and Regret It' (*BBC*, 24 Oct 2024) <https://www.bbc.com/news/articles/cz04emrxp4xo> accessed on 10 July 2025.
[19] Michaela G Murdock, Aditya Tadinada 'Can AI Tools Reliably and Effectively Detect Plagiarism in Scientific Writing?' (*Cureus*, 11 May 2025) <https://pubmed.ncbi.nlm.nih.gov/40502888/> accessed on 10 July 2025.

decisions can affect student outcomes in ways that are inaccurate or unfair.[20] Therefore, while AI can support efficiency and scalability in education, it should not replace the nuanced judgment and insight that only humans can offer.

Legal Implications of AI-Driven ICT

AI tools typically rely on databases to function effectively; in some cases, the data collected includes sensitive information. Without robust safeguards and data governance mechanisms, institutions risk violating major data protection laws, such as the **GDPR** in the European Union or Malaysia's **PDPA 2010**.[21] These laws emphasize the need for users' consent, transparency in data handling and the right of individuals to access the data where non-compliance may result in serious legal liability.

Talking about intellectual property (hereinafter referred as IP) where use of AI-generated content by students through AI platforms like ChatGPT, DeepSeek and other generative AI tools raises uncertainties over who owns the ownership of the academic work.[22] For example, if a student submits an assignment with inputs from AI, the authorship of that content becomes legally ambiguous. In other words, without clear IP policies, it would result in inadvertently compromising academic integrity or violating copyright laws.[23] For instance, Turnitin can be flagged under AI or plagiarism.

Globally, several countries have adopted forward-thinking approaches that balance digital transformation with legal protections and equitable access where Finland ensures equitable digital access by providing free internet and devices to students in need.[24] Finland's national policies prioritize both educational equity and data privacy. On the other hand, South Korea has implemented a comprehensive national digital education strategy,[25] including AI-

[20] 'Recruitment: AI software 'could penalise candidates with disabilities' *Free Malaysia Today* (Malaysia, 1 Jul 2024) <https://www.freemalaysiatoday.com/category/leisure/2024/07/01/recruitment-ai-software-could-penalise-candidates-with-disabilities> accessed on 10 July 2025.
[21] Kherk Ying Chew and Serene Kan 'Malaysia: Personal Data Protection (Amendment) Act 2024 to Come into Force' (*Baker McKenzie InsightPlus,* 27 Dec 2024) <https://insightplus.bakermckenzie.com/bm/data-technology/malaysia-personal-data-protection-amendment-act-2024-to-come-into-force> accessed on 10 July 2025.
[22] Gil Appel, Juliana Neelbauer and David A. Schweidel 'Generative AI Has an Intellectual Property Problem' (*Harvard Business Review*, 7 Apr 2023) <https://hbr.org/2023/04/generative-ai-has-an-intellectual-property-problem> accessed on 10 July 2025.
[23] Sarah Chudleigh, 'Is ChatGPT Copyright Free?' (*botpress*, 12 Jul 2024) <https://botpress.com/blog/are-there-any-legal-or-copyright-concerns-when-using-chatgpt-generated-content> accessed on 10 July 2025.
[24] 'Finland's Educational Success: A Global Model to Follow' (*Global Society World News*, 28 Jan 2025) <https://www.globalsociety.earth/post/finland-s-educational-success-a-global-model-to-follow> accessed on 10 July 2025.
[25] Gabriela Gambi, Hyeri "Mel" Yang, and Ji-Yeon Yi, 'Implementing Edtech at Scale: 3 Lessons from Korea for Digital Transformation' (*IDB*, 18 Mar 2025) <https://blogs.iadb.org/educacion/en/implementing-edtech-at-scale-3-lessons-from-korea-for-digital-transformation/> accessed on 10 July 2025.

powered textbooks whereas Canada provides free Wi-Fi and laptops to rural and low-income students.[26] These initiatives are backed by partnerships and legislative support, ensuring inclusivity and legal protection. Drawing on international practices, its legal implications must not be overlooked where there needs to be clearer policies and legal framework governing this area of law. Learning from this, Malaysia Universities like University Technology of Malaysia also came out with a guideline of the use of AI in teaching giving a clear cut on the do's and don'ts.[27]

Ethical Considerations

ICT in the higher learning institution sets out thorny ethical questions that require strong questioning. One of the most pressing concerns is algorithmic bias, which refers to the unfair outcomes produced when AI systems inherit or amplify inequalities from training data. As an example, in 2020, a report by Ofqual revealed that the A-Level grading algorithm in the UK disproportionately lowered the predicted grades of 39% of students, particularly affecting those from lower-income schools, due to reliance on historical data influenced by wealth disparities.[28] This caused a large-scale backlash and an overturning of the policy resulting in grade assignments by teachers to illustrate that enabling AI to operate without bias is a moral necessity. Likewise, in 2021, it was revealed that an AI-enabled admissions tool at the University of Texas gave preference to students from higher-income backgrounds, following complaints challenging the algorithm's fairness. The issue of surveillance adds additional complications to ethics. Proctoring tools like *Proctorio* and *ExamSoft* using AI have been subject to criticism due to data collection practices they use being seen as invasive.[29]

At Cleveland State University, students complained in 2021 that *Proctorio* was an intrusion into their personal space as it monitored facial expressions and screen utilization and some students felt anxious when they needed to take exams. In 2022, a petition at the University

[26] Innovation S and Canada ED, 'Governments of Canada and Ontario invest over $61 million to bring high-speed Internet access to more than 16,000 homes in Ontario, (*Canada.ca*, 3 Mar 2023) <https://www.canada.ca/en/innovation-science-economic-development/news/2023/03/governments-of-canada-and-ontario-invest-over-61-million-to-bring-high-speed-internet-access-to-more-than-16000-homes-in-ontario.html> accessed on 10 July 2025.

[27] UTM, 'Guidelines For The Use Of Generative Artificial Intelligence In Teaching And Learning' <https://cdex-apps.utm.my/files/guidelines/Guidelines-for-the-Use-of-Generative-Artificial-Intelligence-in-Teaching-and-Learning-UTM.pdf> accessed on 10 July 2025.

[28] Sam Shead, 'How a computer algorithm caused a grading crisis in British schools' (*CNBC*, 21 August 2020) < https://www.cnbc.com/2020/08/21/computer-algorithm-caused-a-grading-crisis-in-british-schools.html> accessed on 31 July 2025.

[29] David G. Balash, Elena Korkes, Miles Grant, and Adam J. Aviv & Rahel A. Fainchtein and Micah Sherr, Educators' Perspectives of Using (or Not Using) Online Exam Proctoring < https://www.usenix.org/system/files/sec23fall-prepub-159-balash.pdf> accessed on 28 July 2025.

of Melbourne against *ExamSoft* contained the objections that they gathered too much data and that this may include biometric data, fearing that there may be attempts to use it improperly. This is worsened by the fact that AI has no ethical control thus, the systems act without any responsibility to human beings.

The case of Dutch university AI tool admissions application favouring male applicants in 2019 raises the question about the transparency and accountability aspects.[30] This accident showcased the dangers of the so-called black box AI, whose logic remains concealed. Transparent algorithms, bias audit, and ethical standards that focus on fairness and inclusivity must be adopted by the institutions to overcome such challenges and protect student privacy. The trust and awareness are also possible through discussions with students about the ethics of AI, as is accomplished in the 2023 AI ethics workshops provided in Stanford University.[31] In the Malaysian context, concerns have also been raised regarding the use of AI-driven proctoring tools during online examinations in local universities, where students reported anxiety and privacy issues due to constant surveillance. Similarly, debates around the introduction of facial recognition in schools to monitor attendance have raised ethical questions about consent, data protection and student rights. These examples highlight that the ethical challenges of AI are not limited to Western countries but are equally relevant in Malaysia.[32]

Taken together, these cases from the UK, US, the Netherlands, and Malaysia demonstrate that while AI can streamline administrative processes in education, its unchecked use risks reinforcing existing inequalities, violating privacy and undermining trust. Therefore, transparency, fairness and strong ethical safeguards are essential to ensure AI serves as a tool for inclusivity rather than exclusivity rather than exclusion.

Impact on Academic Performances

The use of AI-based ICT has a strong influence on academic performance that can be deemed transformative and its application may present challenges that should be investigated to a greater extent. On the one hand, AI helps increase the level of student engagement with the help of interactive and dynamic platforms. As an example, they showed that Coursera now

[30] ‘Artificial Intelligence’ (*Utrecht University*) <https://www.uu.nl/en/masters/artificial-intelligence/admission-and-application> accessed on 29 July 2025.
[31] Seline Akgun and Christine Greenhow, ‘Artificial Intelligence in Education: addressing ethical challenges in K-12 settings’ (2002) 2 AI and Ethics 431-440.
[32] Noralinda Hj Mohammad, Norena Abd Karim Zamri, Mastura Roni, Siti Nur Izyandiana Ab Hadi, Siti Fairuz Nurr Sadikan, Sulaiman Mahzan, ‘Navigating AI Ethics in Malaysian Universities: Addressing Privacy Integrity, and Bias’ (2025) IX(1) IJRISS 2451.

recommends courses using its AI that learns the individual, which has increased the completion rates by 20%.[33] In the same sense, AI tutors, such as Carnegie Learning MATHia, offer real-time, individualized feedback, and the same results show a score increment as much as 15 percent higher in tests that were implemented in 2021.[34] Such devices help students to eliminate certain weaknesses and promote better perception and memorization.

During the COVID-19 pandemic, communication platforms such as a Google Classroom made it possible to continue the educational process even when physical institutions were closed by providing learning opportunities to millions of people.[35] This is because, as depicted in a 2020 report by UNESCO, 90 percent of all students around the world had to use these platforms to continue with their education. Still, there are also detrimental consequences.[36] ChatGPT and similar AI tools are one example launched in 2022 where over-reliance has led to concerns of using them to facilitate academic dishonesty.[37] Turnitin survey conducted in 2023 revealed that one third of university assignments were plagiarized with AI-generated content, which compromises critical thinking and independent problem-solving abilities.[38] This tendency threatens the diminishment of the academic credential and the revision of the intellectuals. Moreover, limited access to technology provides inequality in the results.

Students in rural places are less likely to have access to reliable internet connections or equipment as pointed out by a study done in 2021 that 40 percent of rural students in Malaysia encountered difficulty in online learning because of internet connection problems.[39] This digital situation restricts access to AI-reliant resources, which enlarges the performance

[33] 'Artificial Intelligence Courses' (*Coursera*) <https://www.coursera.org/courses?query=artificial%20intelligence> accessed on 30 July 2025.

[34] Karen Sloan, 'AI in MATHia: It's more than Right and Wrong Answers' (*Carnegie Learning*, 23 July 2024) <https://www.carnegielearning.com/blog/mathia-ai> accessed on 1 August 2025.

[35] Preethi Sharda, 'Online Learning and Teaching using Google Classroom during the COVID-19 Pandemic' (2021) 41(5) DESIDOC Journal of Library & Information Technology 352.

[36] Garen Avanesian, Suguru Mizunoya, and Diogo Amaro, 'How many students could continue learning during COVID-19-caused school closures? Introducing a new reachability indicator for measuring equity of remote learning' (2021) 84 International Journal of Educational Development <https://pmc.ncbi.nlm.nih.gov/articles/PMC9759655/> accessed on 2 August 2025.

[37] Damien Eke, 'ChatGPT and the rise of generative AI: Threat to academic integrity?' (2023) 13 Journal of Responsible Technology <https://www.researchgate.net/publication/368713523_ChatGPT_and_the_rise_of_generative_AI_Threat_to_academic_integrity> accessed on 1 August 2025.

[38] Vanson Bourne, 'Turnitin Releases New Findings and Key Insights from Focused Survey on Impact of AI in Education' (*Turnitin*, 14 April 2025) <https://www.turnitin.com/press/turnitin-releases-new-findings-and-key-insights-from-focused-survey-on-impact-of-ai-in-education> accessed on 1 August 2025.

[39] Azrul Che Yusof, Sara Chinnasamy, & Shifa Faizal, 'COVID-19 Pandemic and Online Distance Learning (ODL) Issues among Malaysian Secondary School Teachers' (2023) 13(4) International Journal of Academic Research in Business and Social Sciences 1704 <https://hrmars.com/papers_submitted/16677/covid-19-pandemic-and-online-distance-learning-odl-issues-among-malaysian-secondary-school-teachers.pdf> accessed on 4 August 2025.

differences between city and country students. Moreover, overdependence on AI tools may result in cognitive laziness, as students learn to value fast response over thoughtful reflection, which has been proven by a study published in 2022 in *Educational Technology Research*, which found that the high use of AI is correlated with the poor analytical abilities of a student when it comes to writing an essay.[40] Institutions can overcome these issues by combining AI with conventional pedagogy, supporting digital literacy as a means to ensure that correct behaviours are in effect and investing in infrastructure to maintain universal accessibility, as this would allow AI to be used to its full potential and safeguard academic honesty and fairness.

Ethical Implications of AI in Higher Education: Case Studies

Real-life case studies can depict vividly the plurality of concerns about the use of AI in ICT in higher education. In 2020, a massive data leak from Blackboard, a large learning management system, used by more than 500 000 students at the University of York, Rutgers University, and so forth.[41] The hack revealed names, emails, and grades; the outcomes were lawsuits and a case settlement of 2 million dollars, which illustrates the importance of sound cybersecurity provisions.[42] The affected universities reacted by introducing end-to-end encryptions and two-factor authentication, but the event demonstrated weakness in the online platforms. Grading systems with algorithmic bias is another case.[43] This case highlights the persistent vulnerability of educational platforms to cybersecurity threats.

In 2018, the International Baccalaureate (IB) used an AI model to grade in context of the COVID-19 disruptions, which graded 20,000 students unfairly as compared to their school historical performance instead of their performance per se.[44] The revelation resulted in international demonstrations and a change of policy to teachers-graded marks and the moral imperative of clear AI systems. Likewise, the same has happened in 2022, where AI grading used in a US university discriminated against non-native English speakers because of biased

[40] Aniella Mihaela Vieriu, 'The Impact of Artificial Intelligence (AI) on Students' Academic Development' (*MDPI*, 11 March 2025) <https://www.mdpi.com/2227-7102/15/3/343> accessed on 1 August 2025.

[41] Alina Bizga, 'Data Breach: University of York Staff and Student Records Stolen in Third-Party Cloud Service Provider Ransomware Attack' (*Bitdefender*, 23 July 2020) <https://www.bitdefender.com/en-us/blog/hotforsecurity/data-breach-university-of-york-staff-and-student-records-stolen-in-third-party-cloud-service-provider-ransomware-attack> accessed on 2 August 2025.

[42] John Leyden, Dan Swinhoe and Michael Hill, 'The 20 biggest data breaches of the 21st century' (*CSO*, 12 June 2025) <https://www.csoonline.com/article/534628/the-biggest-data-breaches-of-the-21st-century.html> accessed on 30 July 2025.

[43] Phat T. Tran-Truong, Minh Q. Pham, Ha X. Son et al., 'A systematic review of multi-factor authentication in digital payment systems: NIST standards alignment and industry implementation analysis' (2025) 162 Journal of Systems Architecture 103402 <https://www.sciencedirect.com/science/article/pii/S1383762125000748> accessed on 2 August 2025.

[44] Anton S. Ovchinnikov, *Ethics and Ai: The 2020 International Baccalaureate Grading Scandal* (Darden Business Publishing 2020) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3740517> accessed on 31 July 2025.

language learners, leading to reassessment of AI grading.[45] Digital inequity is also further illustrated by the story of Veveonah Mosibin in Malaysia.[46]

The story about the Sabah student going to the top of a tree to get internet access to take her exams in 2020 made the news headlines worldwide and highlighted the rural connectivity issues in Malaysia. Her case resulted in the government committing to increasing the provision of broadband through *Jalinan Digital Negara* (Hereinafter referred to as "JENDELA") program but as of 2023 only 60 percent of the rural quarters were covered by 4G.[47] These scenarios are indications of the dire need to have extensive legal regulations, design ethical AI, and invest in infrastructure to make the use of ICT that relies on AI fair and safe. The incident sparked nationwide debate on digital equity in education, pressuring the government to act.

Overall, these case studies demonstrate that the ethical challenges of AI in higher education range from data privacy to bias and access, requiring both technological safeguards and inclusive policy measures.

Recommendations

Policymakers and educational institutions should implement an integrated and liveable approach to deal with the issues of AI-driven ICT. What is first of all needed by the policymakers is the fortification of the legal frameworks. The safety of student privacy can be improved by updating the Personal Data Protection Act 2010 in Malaysia by adding AI-relevant details, like the breach reporting requirement within 72 hours.[48] An example of strict enforcement can be related to the **GDPR** of the EU, which enforces fines of up to 20 million euros of data infringement.[49] To achieve digital inclusivity, a great deal of infrastructure should be invested.

[45] Andrew S. Nelson, 'Students' Perceptions of Generative Artificial Intelligence (GenAI) Use in Academic Writing in English as a Foreign Language' (2025) 15(5) Education Sciences 611 < https://www.mdpi.com/2227-7102/15/5/611> accessed on 4 August 2025.

[46] Hazlin Hassan, 'Malaysia's digital divide makes some students trek up hills and sleep on trees for Internet access' *The Straits Times* (Malaysia, 7 February 2021) <https://www.straitstimes.com/asia/se-asia/malaysias-digital-divide-makes-some-students-trek-up-hills-and-sleep-on-trees-for> accessed on 2 August 2025.

[47] '4G Coverage In Populated Areas In Sarawak At Above 82%' (*Portal Rasmi Kementerian Komunikasi*, 3 Oct 2022) <https://www.komunikasi.gov.my/awam/berita/22915-4g-coverage-in-populated-areas-in-sarawak-at-above-82> accessed on 31 July 2025.

[48] Sakshi Shivhare, 'Malaysia Charts Its Digital Course: A Guide to the New Frameworks for Data Protection and AI Ethics' (*Future of Privacy Forum*, 6 July 2025) < https://fpf.org/blog/malaysia-charts-its-digital-course-a-guide-to-the-new-frameworks-for-data-protection-and-ai-ethics/> accessed on 30 July 2025.

[49] 'Fines / Penalties' (*Intersoft consulting*) <https://gdpr-info.eu/issues/fines-penalties/> accessed on 4 August 2025.

The 100 percent target 4G coverage in Malaysia by the year 2025 (JENDELA program) should be fast-tracked using the public-private partnership as witnessed with the deployment of 5G in South Korea that was deployed in 2 years reaching 95 percent coverage.[50] Accelerating such efforts would especially benefit the B40 group, who are disproportionately affected by poor connectivity and limited affordability, thereby ensuring more equitable access to online education and digital resources. The rules of ethics are essential, and the 2021 AI Ethics Recommendations of UNESCO support the idea of transparency and equity. Policymakers ought to create independent oversight institutions, such as the Centre of Data Ethics and Innovation, in the UK, to check the use of AI in education.[51] Digital literacy programs need to be provided in institutions.

Moreover, the 2023 AI ethics training that touched on 1,000 students at HELP University can also serve as an example of how to educate about the responsible use of ICT.[52] The improved data protection measure would involve updating the encryption levels, like what Monash University did after a breach in 2021,[53] and the regular cybersecurity audit, which the University of Singapore performs every year.[54] Addressing ethical aspects of integrating AI includes bias-free tools and humans supervising the same. In 2022, the AI-enhanced courses available at MIT reported 10 percent fewer grading errors than other courses, according to the school.[55] To avoid threat to the educational values, the institutions should partner with students as witnessed in the Oxford 2023 AI policy forums.[56] The recommendations establish a set of principles on fair, safe, and ethical AI-based education.

[50] John Tanner, ‘Malaysia JENDELA broadband project on track for 2025 completion’ (*Developing Telecoms*, 26 March 2024) <https://developingtelecoms.com/telecom-business/telecom-regulation/16472-malaysia-jendela-broadband-project-on-track-for-2025-completion.html> accessed on 2 August 2025.

[51] UNESCO, *Recommendation on the Ethics of Artificial Intelligence* (UNESCO 2022) <https://www.unesco.org/en/articles/recommendation-ethics-artificial-intelligence> accessed on 4 August 2025.

[52] ‘Prof. Dr. R. Logeswaran Leads AI Integration Training for Teachers at SNJK Yu Hua, Kajang’ (*HELP University*, 19 June 2024) <https://university.help.edu.my/prof-dr-r-logeswaran-leads-ai-integration-training-for-teachers-at-snjk-yu-hua-kajang/> accessed on 4 August 2025.

[53] ‘Finding a fix for Indonesia’s data protection problems’ (*Monash University*, 10 May 2024) <https://lens.monash.edu/@technology/2024/05/10/1386401/finding-a-fix-for-indonesias-data-protection-problems> accessed on 4 August 2025.

[54] The Bioethics Advisory Committee of Singapore, *Ethical Use of Big Data and Artificial Intelligence in Biomedical Research* (Report, February 2025) <https://file.go.gov.sg/bac-bdai-report-2025.pdf> accessed on 4 August 2025.

[55] ‘An online course designed to enhance your generative AI expertise’ (*MIT Professional Education*) <https://professionalprograms.mit.edu/online-program-generative-ai/#:~:text=MIT%20Professional%20Education's%20online%20course,create%20new%20pathways%20for%20innovation> accessed on 4 August 2025.

[56] ‘AI in education: where we are and what happens next’ (*Oxford University Press*, 18 October 2023) <https://corp.oup.com/feature/ai-in-education-where-we-are-and-what-happens-next/> accessed on 4 August 2025.

Conclusion

The digitization of ICT in higher education has opened up a new era of possibilities, which enable individuals to access tailored instruction, enhanced interactivity, and more efficient scholarly workflows, among other advancements. The effects of this digital shift are however coupled with the advancement of problems affecting the students, especially with lower income classes like B40 in the Malaysian case, as they experience the difficulties in being exposed to stable internet connection and up-to-date devices. All these differences widen the digital divide, which calls into question education equity.

To take advantage of the potential of the AI-driven ICT, a policymaker and an institution should focus on investments in digital infrastructure observed in initiatives such as the JENDELA program in Malaysia and implement the complex set of legal and ethical codes that are driven by the best practices seen in such areas as equitable access policies in Finland and the AI Ethics recommendations by UNESCO. Finally, this should and must be done through collaboration of policymakers, educators, and students to achieve an equitable, safe, and ethically desirable artistic education environment where AI may be utilized to the end of maximizing learning success without infringing academic standards and fairness.