



Contents lists available at www.journal.unipdu.ac.id

Register

Journal Page is available to www.journal.unipdu.ac.id/index.php/register



Research article

AI Ethics in Indonesian Higher Education: A Systematic Review of Algorithmic Bias, Privacy, and Accountability

Yomi Agung Susanto ^{a,*}, Eko Hariadi ^b, Lilik Anifah ^c, Ratna Suhartini ^d, Purwoko Ajie ^e

^a Doctoral Program in Vocational Education, State University of Surabaya, Pacitan, Indonesia

^{b,c,d} Doctoral Program in Vocational Education, State University of Surabaya, Surabaya, Indonesia

^e Master's Degree in Cultural Studies, Sebelas Maret University Surakarta, Indonesia.

email: ^{a,*} yomi.23004@mhs.unesa.ac.id, ^b ekohariadi@unesa.ac.id, ^c lilikanifah@unesa.ac.id, ^d ratnasuhartini@unesa.ac.id,

^e purwokoajie@student.uns.ac.id

* Correspondence

ARTICLE INFO

Article history:

Received March 1st, 2026

Revised March 9th, 2026

Accepted June 11th, 2026

Available online June 20th, 2026

Keywords:

AI Ethics

Higher Education

Data Privacy

Accountability

Systematic Literature Review

Please cite this article in IEEE

style as:

Y.A. Susanto, E. Hariadi, L. Anifah, R. Suhartini, P. Ajie, "AI Ethics in Indonesian Higher Education: A Systematic Review of Algorithmic Bias, Privacy, and Accountability", : Jurnal Ilmiah Teknologi Sistem Informasi, vol. 12, no. 1, pp. 22-44, 2026.

ABSTRACT

Artificial Intelligence (AI) is increasingly integrated into higher education to enhance personalised learning, automate assessment, and improve institutional efficiency. However, its rapid adoption also raises ethical concerns related to algorithmic bias, data privacy, and accountability, particularly in Indonesia, where regulatory frameworks and digital infrastructure remain underdeveloped. Despite growing global discussions on AI ethics, limited studies have systematically examined these challenges within Indonesian higher education. This study analyses the ethical implications of AI integration by focusing on algorithmic fairness, data privacy, and governance accountability. Employing a narrative review approach supported by the PRISMA 2020 framework, this study systematically reviews 56 studies retrieved from the Scopus database between 2021 and 2025. Article screening was conducted using Covidence, while VOSviewer was utilised to identify research trends and thematic gaps. The findings reveal three major ethical concerns: (1) algorithmic bias in AI-driven assessment and admissions systems; (2) risks to data privacy and student surveillance associated with learning analytics; and (3) limited transparency and accountability in AI-based decision-making. The study further identifies significant gaps in Indonesia's policy readiness and institutional governance. As its contribution, this study proposes a culturally grounded approach to AI governance and recommends the development of a National AI in Education Ethics Charter to support responsible and equitable AI integration in higher education.

Register with CC BY NC SA license. Copyright © 2026, the author(s)

1. Introduction

The accelerated integration of Artificial Intelligence (AI) into higher education is transforming pedagogical frameworks, assessment systems, and institutional governance. AI tools, such as automated grading systems, intelligent tutoring applications, and adaptive learning platforms, are increasingly used to improve instructional efficiency and learner engagement [1], [2]. While the educational use of AI dates back to the 1970s, recent developments have expanded its reach, ranging from language acquisition using natural language processing to large-scale administrative optimisation [3], [4]. Distance learning institutions like the University of South Africa (UNISA) exemplify this trend by adopting systems such as ChatGPT for teaching and assessment in mass education modules [5].

Educators' perceptions of AI's capacity to improve job performance are critical to influencing adoption. This includes improving teaching outcomes, reducing administrative burden, and enhancing student autonomy [6]. When instructors feel competent in implementing AI-supported strategies, their perceived control increases the likelihood of implementation [7]. However, the Indonesian context presents significant challenges. The country's underdeveloped digital infrastructure, weak regulatory

oversight, and fragmented policy landscape raise concerns about algorithmic bias, data security, and systemic opacity in AI decision-making: issues that intersect with broader questions of equity and social justice.

Previous studies identify three structural impediments to AI adoption in Indonesia: insufficient digital infrastructure, uneven internet access, and the absence of comprehensive governance frameworks [8]. These challenges intersect with existing socio-economic disparities, particularly in rural and underserved areas, further exacerbating technological exclusion [9]. Addressing these limitations requires a calibrated approach that balances innovation with ethical safeguards, thereby emphasising the need for inclusive policymaking and digital literacy [10], [11], [12].

Despite these constraints, AI also offers transformative opportunities. It can personalise instruction, support differentiated learning, and facilitate engagement among diverse student populations [13], [14]. However, the ethical risks surrounding academic integrity, surveillance, and algorithmic opacity must be acknowledged and mitigated. As Popenici and Kerr (2017) warn, without proper governance, AI tools risk eroding key values such as privacy, autonomy, and educational fairness [15].

By comparison, Southeast Asian nations have adopted uneven approaches to AI governance. Singapore's National AI Strategy and Malaysia's AI-RMAP 2021-2025 offer frameworks that integrate ethical principles with educational reform [16], [17]. These initiatives include significant investment in AI research and public infrastructure, aiming to cultivate digital citizenship [18], [19]. Indonesia, however, has progressed more slowly. Although institutional awareness is rising, policy efforts remain fragmented and lack explicit ethical directives [20], [21]. Moreover, there is limited coordination among key stakeholders, impeding efforts to build capacity for ethical governance [22], [23].

A comparative analysis suggests that the regulatory maturity in countries like Singapore and Malaysia could inform Indonesia's national AI development strategies [24], [25]. Notably, while global discourse on AI and education expands rapidly, Southeast Asia remains underrepresented, particularly in normative scholarship. Few regionally contextualised frameworks exist to guide ethical implementation, creating a disconnect between global principles and local realities.

Despite the rapid expansion of global scholarship on AI ethics in education, existing studies predominantly focus on technological adoption, pedagogical innovation, or governance frameworks in developed countries. Limited attention has been given to how ethical concerns such as algorithmic bias, data privacy, and accountability manifest within higher education systems in developing countries, particularly those in Indonesia and Southeast Asia. Moreover, existing research rarely integrates ethical governance discussions with the socio-political, infrastructural, and cultural realities that shape AI implementation in Indonesian higher education institutions. This gap highlights the need for a context-sensitive review that critically examines the ethical dimensions of AI adoption beyond Global North-centric perspectives.

To address these gaps, this study formulates the following research questions:

RQ1: What ethical risks (e.g., bias, privacy, and accountability) are identified in the use of AI in higher education?

RQ2: What mitigation strategies or governance frameworks have been proposed to address these ethical risks?

RQ3: What conditions enable the ethical integration of AI in Indonesian higher education?

To address these research gaps, this study synthesises 56 peer-reviewed studies with a particular focus on Indonesia. The goal is not merely to describe technological trends, but to interrogate the ethical tensions arising from AI adoption in higher education, particularly in relation to algorithmic bias, data privacy, and accountability.

By adopting best practices and integrating global insights with local norms, Indonesia can begin constructing a governance model that balances innovation with ethical responsibility [26]. Doing so would require not only technological readiness but also political will, institutional leadership, and civil society engagement.

Unlike existing reviews that primarily focus on technological adoption or general AI governance frameworks, this study explicitly examines AI ethics through the socio-political, infrastructural, and cultural realities of Indonesian higher education. By foregrounding a developing-country perspective,

the study moves beyond Global North-centric discussions and highlights how ethical risks and governance challenges are shaped by the local educational conditions.

Thus, this paper examines the ethical implications of AI integration in Indonesian higher education by addressing three interrelated domains: algorithmic bias, data privacy, and accountability. Drawing upon interdisciplinary literature and a systematic review approach, this study explores how these challenges manifest within Southeast Asian educational contexts and proposes contextually relevant governance strategies.

The novelty of this study lies in its regionally grounded and context-sensitive analysis of AI ethics in Indonesian higher education. While existing scholarship predominantly reflects experiences from developed countries, this review contextualises global ethical frameworks within Indonesia's socio-political, technological, and educational realities. By synthesising evidence from 56 peer-reviewed studies, this review contributes a culturally responsive governance perspective and proposes actionable conditions for the ethical integration of AI in developing higher education systems.

2. Materials and Methods

This study employs a systematic narrative review approach to analyse the ethical and data security challenges associated with AI adoption in higher education. The review combines qualitative literature synthesis with systematic screening procedures to critically examine conceptual debates, governance issues, and policy implications related to AI ethics in educational contexts [27].

To enhance methodological transparency and analytical rigour, the review process was guided by the PRISMA 2020 framework. In addition, bibliometric analysis using VOSviewer was integrated to visualise research trends, identify key themes, and highlight gaps in the existing literature. Additionally, Covidence was utilised as a screening tool to support article selection, de-duplication, and eligibility assessment in a structured and transparent manner.

2.1. Data Sources and Search Strategy

Relevant literature was retrieved exclusively from the Scopus database using a Boolean search strategy to ensure access to high-quality, peer-reviewed sources. The search was limited to journal articles and conference papers published between 2021 and 2025, written in English, and addressing key issues such as algorithmic bias, data privacy, and AI governance in higher education. Studies focusing exclusively on technical AI development without addressing ethical or governance issues were excluded from the review.

The initial search yielded 2,135 articles. After a rigorous screening and de-duplication process conducted via Covidence, 499 articles were deemed potentially relevant. These articles were further examined for full-text availability and thematic relevance. To ensure transparency and replicability of the search process, the Boolean search strings and the corresponding number of records retrieved from Scopus are summarised in Table 1.

Table 1. Boolean Search Strategy and Initial Article Retrieval.

Keyword String	Scopus
("artificial intelligence" OR AI) AND ("higher education" OR universities OR colleges)	600
("artificial intelligence" OR AI) AND ("higher education" OR universities OR colleges) AND ("Indonesia" OR "Southeast Asia")	99
("artificial intelligence" OR AI) AND ("ethics" OR "algorithmic bias" OR "data privacy" OR "AI governance")	600
("artificial intelligence" OR AI) AND ("ethics" OR "algorithmic bias") AND ("policy recommendations" OR "AI governance")	217
("artificial intelligence" OR AI) AND ("accountability" OR "transparency" OR "policy recommendations")	600
("artificial intelligence" OR AI) AND ("accountability" OR "transparency") AND ("Indonesia" OR "Southeast Asia")	19
Total Article	2,135

2.2. Screening and Selection Process

A systematic review was conducted in accordance with the PRISMA 2020 framework. The selection process is visually presented in Fig. 1.

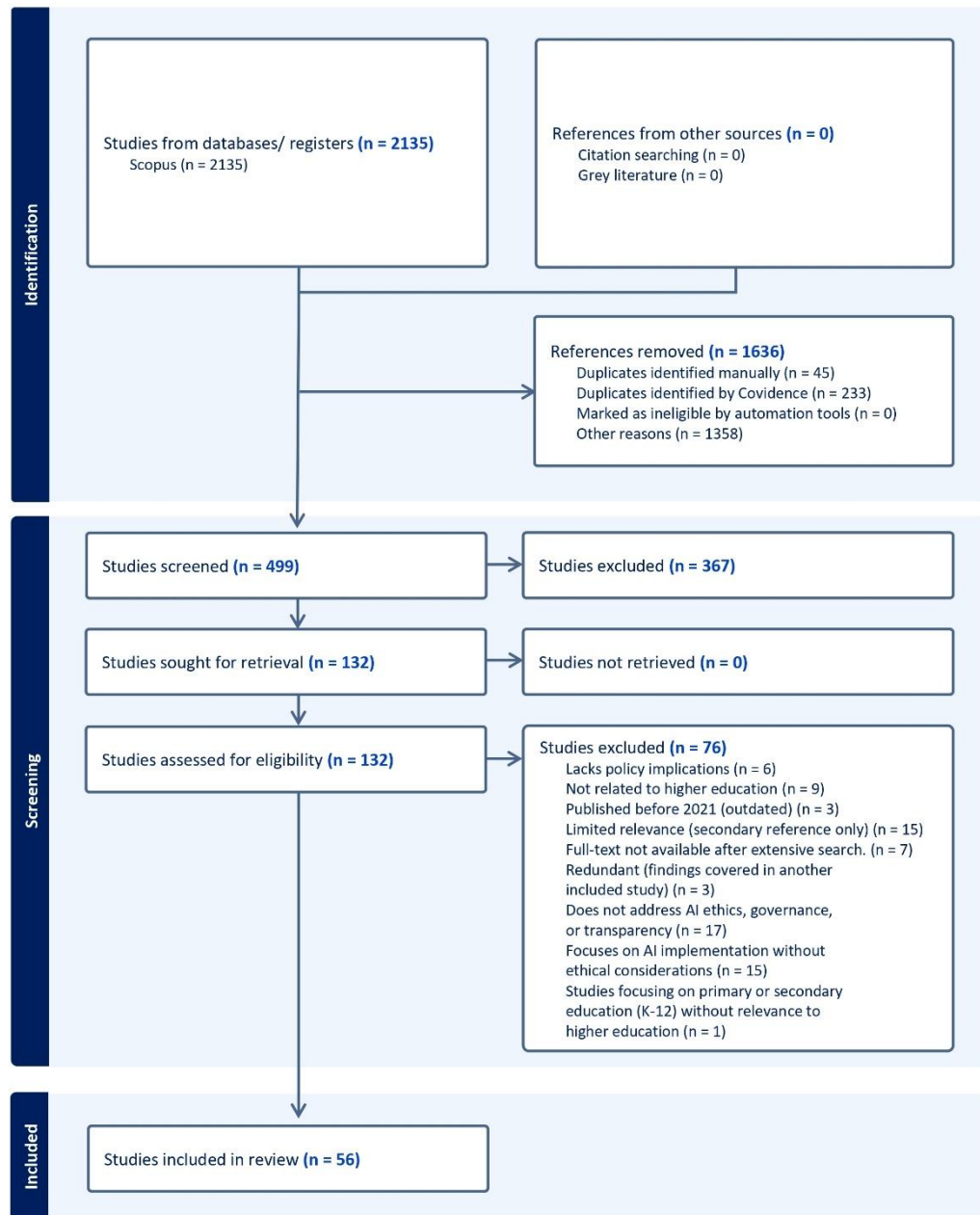


Fig. 1. PRISMA Flow Diagram of the Literature Selection Process.

2.2.1. Identification

A total of 2,135 records were retrieved from Scopus. Of these, 45 duplicate records were removed manually, 233 duplicates removed using Covidence, and 1,358 other irrelevant records were excluded. Total records excluded at this stage was 1,636.

2.2.2. Screening

The remaining 499 studies were screened based on titles and abstracts. Following this process, a total of 367 studies were excluded because they did not meet the inclusion criteria, including insufficient relevance to the research objectives, lack of focus on AI ethics and governance, non-higher-education contexts, and other screening considerations identified during the preliminary assessment. Consequently, 132 studies were retained for full-text eligibility assessment.

2.2.3. Eligibility

The 132 eligible studies were assessed through full-text review. During this stage, 76 studies were excluded for the following reasons: lack of policy implications (6), irrelevance to higher education (9), outdated publication (3), limited relevance (15), unavailable full-texts (7), redundancy (3), lack of ethical focus (17), technical-only AI studies (15), and K-12-only focus (1). Ultimately, 56 studies met all inclusion criteria and were included in the final review.

2.3. Data Categorisation

To ensure analytical consistency, the selected studies were coded using a thematic classification approach. The coding process focused on identifying recurring ethical issues, governance concerns, policy recommendations, and implementation challenges related to AI adoption in higher education. Initial codes were derived inductively from the reviewed literature and subsequently grouped into broader analytical themes based on conceptual similarity and frequency of occurrence.

Based on this process, the 56 included studies were organised into three major analytical domains: (1) Algorithmic Fairness and Bias, focusing on the impact of AI on assessment systems, admissions processes, and student equity; (2) Data Privacy and Security, examining challenges related to AI-driven monitoring, surveillance, and learning analytics; and (3) Transparency and Accountability, addressing governance models, explainability, and ethical responsibility in AI-based educational decision-making.

2.4. Data Analysis

A comparative content analysis was conducted to synthesise findings across the selected studies. The analysis examined similarities and differences in how ethical risks, governance challenges, and mitigation strategies were discussed across diverse higher education contexts. Particular attention was given to studies focusing on developing countries and Southeast Asian educational systems.

Thematic synthesis was employed to identify recurring patterns related to algorithmic bias, data privacy, and accountability. Findings from the reviewed literature were then critically compared to identify convergences, divergences, and gaps in existing AI ethics frameworks.

To complement the qualitative synthesis, bibliometric analysis using VOSviewer was employed to: (1) map research trends in AI integration within higher education; (2) identify thematic gaps in the Indonesian context; and (3) visualise key co-occurring terms in AI ethics and governance research. The combined findings supported the formulation of policy recommendations for responsible AI implementation in Indonesian higher education institutions.

3. Results and Discussion

3.1. Results

The bibliometric analysis and thematic synthesis reveal several dominant patterns in the contemporary discourse on AI ethics in higher education. Across the 56 reviewed studies, three interrelated ethical dimensions consistently emerged: algorithmic fairness and bias, data privacy and security, and transparency and accountability. The analysis further demonstrate a significant geographic imbalance, with most studies originating from the Global North contexts and only limited representation from Southeast Asia, particularly Indonesia.

The VOSviewer visualisation (see Fig. 2) illustrates the conceptual topology of AI ethics in higher education. The term “Artificial intelligence” functions as the central node, strongly connected to ethical concepts such as “privacy,” “bias,” “governance,” “accountability,” and “transparency,” indicating the increasing convergence between technological adoption and ethical governance concerns.

Newer terms such as “generative AI”, “ChatGPT”, and “chatbot” appear in bright yellow clusters, signifying their post-2023 emergence and the growing salience of generative tools in educational contexts [28]. These terms reflect a shifting ethical terrain, increasingly characterised by pedagogical automation, diminished student agency, and rapid technological transformation. The overlay map also illustrate the temporal evolution of research, with early-stage concerns like “explainability” and “interpretability” (in dark blue) gradually giving way to newer debates focused on student data usage and institutional governance.

The frequent co-occurrence of terms such as “bias”, “policy”, “data privacy”, and “governance” highlights the complex interdependence of ethical risks. Notably, the proximity between “student” and “data” suggests a recurring theme: students are increasingly positioned as algorithmically managed data subjects, raising persistent concerns about surveillance, consent, and profiling.

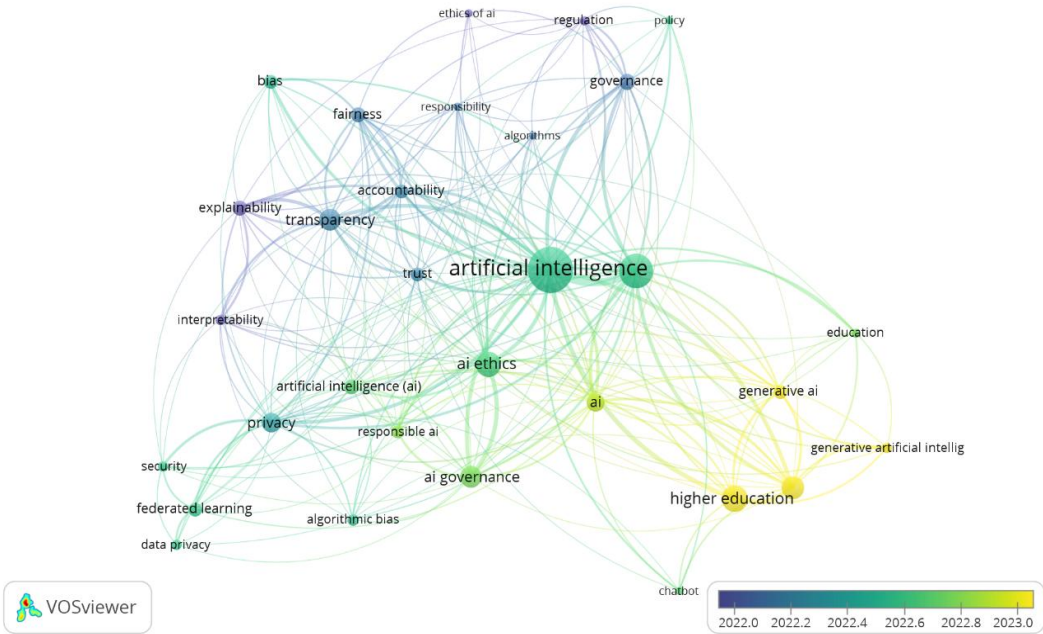


Fig. 2. Network Visualization of AI-Related Concepts in Higher Education. In the Indonesian context, ethical discourse on AI in higher education remains at an early stage. Key national agencies, including KEMENDIKDASMEN, KEMENDIKTISAINTEK, KEMENKEBUD, BRIN, and KOMINFO, have initiated preliminary discussions on AI regulation in education. However, institutional fragmentation and regulatory inertia continue to hinder policy development. While KEMENDIKDASMEN has addressed student data protection in basic education, the higher education sector lacks a cohesive policy architecture. Ethical challenges, ranging from algorithmic fairness to institutional accountability, continue to outpace regulatory action, highlighting the urgent need for a harmonised, culturally attuned governance framework that aligns AI adoption with justice, transparency, and student rights across the Indonesian educational landscape.

3.1.1. Thematic Distribution and Methodological Synthesis

Table 2 presents the thematic categorisation of the 56 peer-reviewed studies selected from an initial pool of 2,135 records retrieved from Scopus. These studies are organised into three primary ethical domains, identified through the triangulation of qualitative coding and bibliometric clustering: (1) Algorithmic Fairness and Bias (n = 9); (2) Data Privacy and Security (n = 9); and (3) Transparency and Accountability (n = 12).

The remaining studies address overlapping themes or fall into adjacent categories that are not explored in depth in this review. Notably, only nine studies explicitly focus on Southeast Asian contexts, with four specifically examining Indonesia. These figures indicate a substantial geographic imbalance and highlight a critical absence of regionally grounded scholarship in the global AI ethics discourse.

Table 2. Thematic Distribution of the 56 Peer-Reviewed Studies on AI Ethics in Higher Education (Covidence Extraction).

Domain	Number of Studies	Regional Focus	Key Themes
Algorithmic Fairness & Bias	9	Mostly Global North	Bias in admission/grading, representational harm.
Data Privacy & Security	9	Global, some Asia	Surveillance, consent, asymmetry in data governance.
Transparency & Accountability	12	North America, EU	Governance, auditability, policy design.
Southeast Asia-Specific Cases	9 (of 56 total)	SEA (4 focused in Indonesia)	Descriptive research, emerging frameworks, low policy density.

The distribution of studies demonstrates that Transparency and Accountability is the most extensively discussed ethical domain, reflecting an increasing emphasis over institutional governance and

explainability in AI-driven educational systems. In contrast, the relatively limited number of Southeast Asia-focused studies reflects a substantial regional research gap, particularly regarding context-sensitive ethical governance in Indonesian higher education.

To complement the thematic overview, Table 3 synthesises the methodological quality and contextual scope of the 56 reviewed studies. While 28 studies demonstrate high methodological transparency, detailing sampling strategies, analytic procedures, and theoretical framing, others fall short of such clarity, particularly regarding data collection processes. Furthermore, the analysis revealed moderate to high risk of reporting bias in at least one-third of the studies, primarily resulting from selective presentation of findings or the absence of limitations.

Citation metrics further reflect a divided landscape. Seventeen studies have achieved notable scholarly impact, whereas 15 have been cited two times or fewer in Scopus, possibly reflecting their recency or niche focus. More importantly, only nine studies engage explicitly with Southeast Asian or Indonesian contexts, whereas 47 make no regional reference whatsoever. This stark imbalance highlights an urgent need for more localized research efforts and policy-relevant investigations in the Global South.

Table 3. Quality Assessment Summary of Reviewed Studies.

Quality Indicator	High (n)	Medium (n)	Low (n)	Notes
Methodological Transparency	~28	~19	~9	Many studies outline methods clearly, but some lack sampling detail.
Reporting Bias Risk	~21	~16	~19	Issues include selection bias and underreporting of limitations.
Academic Impact (Citation Record)	~17	~24	~15	15 studies had two or fewer Scopus citations.
Regional Contextualisation	9	-	47	Only nine contextualised in SEA; 4 focused on Indonesia.

3.1.2. Algorithmic Fairness and Bias

Nine studies in this review examined the ethical implications of algorithmic bias in AI-driven systems within higher education. Although AI promises efficiency in admissions, grading, and personalised learning, it also poses the risk of perpetuating socio-technical discrimination due to biased training data, culturally non-representative logic, and opaque decision-making structures [29], [30]. A detailed overview of these studies is available in Table 4, which categorises each work according to ethical domain, methodology, and regional focus.

Table 4. Annotated Table of Studies on Algorithmic Bias in Higher Education.

No	Author(s)/Year	Journal	Region Focus	Ethical Domain	Study Design	Data Method	Key Issues
1	[64]	Quality Assurance in Education	Other: Not explicitly mentioned	Algorithmic Bias	Mixed-Methods	Interview	Teaching & Learning
2	[36]	International Journal of Intel...	Global Comparison	Algorithmic Bias	Mixed-Methods	Secondary Data	Teaching & Learning
3	[32]	International Journal of Artif...	Global Comparison	Algorithmic Bias	Qualitative	Policy Analysis	Teaching & Learning
4	[29]	International Journal of Educa...	Global Comparison	Algorithmic Bias	Qualitative	Secondary Data	Teaching & Learning
5	[30]	Assessment and Evaluation in H...	Global Comparison	Algorithmic Bias	Qualitative	Policy Analysis	Assessment
6	[35]	CEUR Workshop Proceedings	Other: Hungary	Algorithmic Bias	Mixed-Methods	Survey	Teaching & Learning

No	Author(s)/ Year	Journal	Region Focus	Ethical Domain	Study Design	Data Method	Key Issues
7	[34]	Journal of Systems and Softwar...	Global Comparison	Algorithmic Bias	Qualitative	Secondary Data	Teaching & Learning
8	[33]	CEUR Workshop Proceedings International	Other: Ukraine	Algorithmic Bias	Quantitativ e	Secondary Data	Assessmen t
9	[31]	Journal of Human...	Global Comparison	Algorithmic Bias	Qualitative	Policy Analysis	Teaching & Learning

A consistent concern across the literature is the unfair penalisation of students from underrepresented linguistic and ethnic backgrounds, particularly within automated assessment systems. Studies by [31] and [32] highlight how most AI tools fail to accommodate epistemic and cultural diversity, placing students outside dominant knowledge systems at a structural disadvantage. Similarly, global comparative studies suggest that generative AI tends to marginalise non-Western epistemologies, while algorithmic assessments often underperform in assessing students with non-normative learning patterns [33].

These challenges are particularly more acute in countries such as Indonesia, where infrastructural gaps and the absence of ethical guidelines intensify risks of algorithmic injustice. As shown in Table 4, Southeast Asian contexts are represented in only a minority of the nine reviewed studies on algorithmic bias, reflecting a critical lack of regional perspectives. Furthermore, [34] warn that many AI systems are imported from the Global North without adequate localisation, rendering them “*technically sound but ethically fragile*”.

The bibliometric findings further indicate that algorithmic bias manifests beyond grading to influence linguistic representation, cultural relevance, and pedagogy. Chatbot tutors and AI learning platforms often exclude regional dialects and local educational frameworks [35], [36], contributing to what some term digital epistemicide, the erasure of local knowledge systems through standardised algorithmic processes.

In response, there is a pressing need for algorithmic audits, culturally inclusive datasets, and participatory design practices that prioritise the experiences of marginalised student. Without such interventions, AI risks entrenching the very inequities it is intended to overcome.

3.1.3. Data Privacy and Security

Nine studies reviewed under the theme of Privacy and Data Security highlight growing ethical concerns related to AI-enabled surveillance, facial recognition, and predictive learning analytics in higher education. These concerns arise from the pervasive collection and processing of student data through digital platforms, often without transparent procedures or informed consent, thereby undermining the principles of autonomy and privacy.

Studies by [37] and [7] demonstrate that AI-powered learning management systems depend heavily on user tracking and survey data, creating structural imbalances between institutions and students. Students are rarely afforded meaningful agency in negotiating how their behavioural data are gathered, interpreted, and deployed.

Review-based analyses by [39] and [40] further suggest that institutional data governance often prioritises operational efficiency over ethical considerations, accelerating the datafication of learners. Consequently, students’ identities are algorithmically reduced to performance metrics and predictive profiles, which are subsequently used for monitoring and intervention without adequate engagement or consent.

This dynamic is particularly concerning in Indonesia. A study by [41], the only study to explicitly focus on the Indonesian context, found low levels of student awareness regarding privacy practices on online learning platforms. This finding indicates not only a gap in data literacy but also a lack of robust, localised regulatory safeguards for AI use in education.

Methodologically, several studies, including [42], [43], [44], and [2] rely on secondary data to demonstrate how many AI systems function as “*black boxes*”, obscuring their internal processes from

public scrutiny and hindering auditability. This opacity raises broader concerns about institutional accountability when deploying AI systems that significantly impact student rights.

Overall, this body of literature underscores the urgent need for higher education institutions to adopt privacy-by-design principles, promote data ethics education, and enforce inclusive governance frameworks. Without such interventions, AI adoption in Indonesia risks reinforcing opaque, asymmetrical systems that undermine trust and compromise student agency. A full overview of the nine key studies informing this analysis is presented in Table 5, which categorises each article according to its focus on surveillance, privacy, and data governance in educational settings.

Table 5. Annotated Table of Studies on Privacy and Data Security in Higher Education.

No	Author(s)/ Year	Journal	Region Focus	Ethical Domain	Study Design	Data Method	Key Issues
1	[37]	Information Systems Frontiers	Other: Not specifically mentioned	Privacy & Data Security	Mixed- Methods	Survey	Teaching & Learning
2	[42]	Australasian Journal of Educat...	Global Comparison	Privacy & Data Security	Quantitative	Secondary Data	Teaching & Learning
3	[39]	Comunicar	Other: UNESCO	Privacy & Data Security	Qualitative	Other: Documentar y Review	Teaching & Learning
4	[7]	Technology in Society	Global Comparison	Privacy & Data Security	Quantitative	Survey	Teaching & Learning
5	[41]	Cogent Education	Indonesia	Privacy & Data Security	Quantitative	Survey	Teaching & Learning
6	[43]	Journal of Applied Learning an...	Global Comparison	Privacy & Data Security	Qualitative	Secondary Data	Teaching & Learning
7	[44]	Education and Information Tech...	Other: Not specified	Privacy & Data Security	Qualitative	Secondary Data	Teaching & Learning
8	[40]	Government Information Quarter...	Global Comparison	Privacy & Data Security	Qualitative	Other: Systematic Literature Review	Administra tion
9	[2]	Journal of Higher Education Th...	Global Comparison	Privacy & Data Security	Qualitative	Secondary Data	Teaching & Learning

3.1.4. Transparency and Accountability

Twelve studies reviewed under the Transparency and Accountability domain underscore the growing need for robust governance frameworks and procedural transparency in the deployment of AI within higher education. As summarised in Table 6, the studies converge on a critical finding: most institutions are unprepared, both technically and ethically, to govern AI tools that increasingly influence pedagogical, administrative, and evaluative processes.

Table 6. Annotated Table of Studies on Transparency and Accountability in Higher Education.

No	Author (s) Year	Journal	Region Focus	Ethical Domain	Study Design	Data Method	Key Issues
1	[46]	Education and Information Tech...	Other: United Arab Emirates (UAE)	Transparency & Accountability	Quantitative	Survey	Administration

No	Author (s) Year	Journal	Region Focus	Ethical Domain	Study Design	Data Method	Key Issues
2	[65]	Sci	Other:-	Transparency & Accountability	Qualitative	Secondary Data	Research
3	[66]	International Journal of Artif...	Global Comparison	Transparency & Accountability	Qualitative	Survey	Other: Education
4	[52]	Journal of University Teaching...	Other: Australia	Transparency & Accountability	Mixed- Methods	Survey	Teaching & Learning
5	[67]	Sustainability (Switzerland)	Global Comparison	Transparency & Accountability	Qualitative	Secondary Data	Teaching & Learning
6	[47]	Computers and Education: Artif...	Other: Not specified	Transparency & Accountability	Quantitative	Survey	Teaching & Learning
7	[48]	Education Sciences	Global Comparison	Transparency & Accountability	Qualitative	Secondary Data	Teaching & Learning
8	[49]	AI and Society	Other: United Kingdom	Transparency & Accountability	Qualitative	Interview	Other: Not specified
9	[68]	Journal of Applied Learning an...	Global Comparison	Transparency & Accountability	Qualitative	Policy Analysis	Teaching & Learning
10	[51]	Journal of Applied Learning an...	Global Comparison	Transparency & Accountability	Qualitative	Secondary Data	Assessment
11	[50]	TEM Journal	Global Comparison	Transparency & Accountability	Qualitative	Policy Analysis	Teaching & Learning
12	[53]	British Journal of Educational...	Other: Poland and Egypt – cross- cultural comparison	Transparency & Accountability	Quantitative	Survey	Teaching & Learning

The research corpus highlights how institutions frequently mischaracterise AI as a neutral technology, ignoring its nature as a sociotechnical system embedded in ideological assumptions and normative implications. Empirical evidence from [46] and [47] demonstrate how institutional actors lack the capability to conduct algorithmic audits or critically engage with opaque decision-making systems. The adoption of AI, ranging from course recommendations to predictive analytics, has outpaced the development of transparency protocols and explainability standards, leaving critical decisions untraceable and unchallengeable [48], [49].

The inadequacy of top-down oversight is further highlighted by [50] and [51], who argue for participatory AI governance. These scholars propose dialogical mechanisms through which diverse stakeholders, students, lecturers, IT professionals, and policymakers, co-develop ethical codes, thereby embedding legitimacy and local contextual awareness into institutional AI strategies.

Geopolitically, however, these conversations remain concentrated in the Global North. Case studies from the UK, Australia, Poland, and Egypt dominate the field [52], [53], while Southeast Asian voices are noticeably absent. This epistemic imbalance mirrors broader structural inequities, whereby AI governance models are exported from liberal Western democracies and transplanted without sufficient adaptation to the socio-political realities of low- and middle-income nations.

This detachment is evident in the bibliometric visualisations accompanying this review, where keywords such as “*governance*” and “*policy*” are semantically disconnected from terms such as “*Southeast Asia*” and “*Indonesia*.” Such conceptual fragmentation reflects a deeper policy inertia, whereby imported frameworks eclipse locally grounded ethical needs and position regional actors as passive recipients rather than co-creators of AI ethics discourse.

To redress these asymmetries, institutions must shift from techno-solutionist approaches towards reflexive, inclusive, and context-sensitive governance. The implementation of algorithmic transparency, institutional audits, and participatory co-regulation is essential for preserving democratic values and public trust. In the absence of these mechanisms, the unchecked use of AI risks exacerbating institutional opacity and eroding educational accountability.

Importantly, the three ethical domains identified in this review are deeply interconnected rather than isolated concerns. Algorithmic bias is frequently reinforced by weak transparency mechanisms, while inadequate accountability structures often enable problematic data collection and surveillance practices. Similarly, privacy violations are intensified when institutions lack clear governance frameworks or audit procedures. These interdependencies suggest that ethical AI integration in higher education cannot be addressed through fragmented policy interventions alone. Instead, a holistic governance approach is required to simultaneously address fairness, data protection, institutional accountability, and cultural inclusivity.

3.1.5. Thematic Gaps in Southeast Asian Contexts

Despite synthesising 56 peer-reviewed studies, this review reveals a significant thematic and geographic asymmetry in AI ethics literature. Only 9 studies explicitly examine the ethical dimensions of AI within Southeast Asian higher education, with only four focusing on Indonesia. This imbalance is further illustrated in Table 7, which summarises 26 studies addressing diverse ethical concerns, ranging from academic integrity and digital literacy to policy fragmentation, with only a minor subset engaging meaningfully with regional or national contexts. The disparity signals a broader epistemic exclusion, wherein Southeast Asian institutions and scholars remain peripheral to global discourses on algorithmic fairness, data governance, and AI accountability.

Table 7. Miscellaneous Studies on Other Ethical Concerns Related to AI in Higher Education.

No	Author(s) Year	Journal	Region Focus	Ethical Domain	Study Design	Data Method	Key Issues
1	[69]	Higher Education Sustainability (Switzerland)	Global Comparison	Policy Gaps	Qualitative	Secondary Data	Teaching & Learning
2	[70]	International Journal of Educational Innovation	Other: Romania and Serbia	Other: None	Quantitative	Survey	Teaching & Learning
3	[3]	International Journal of Educational Innovation	Other: Hongkong	Policy Gaps	Mixed-Methods	Survey	Teaching & Learning
4	[71]	Education and Technology	Global Comparison	Other: Academic Integrity	Qualitative	Secondary Data	Teaching & Learning
5	[4]	International Journal of Educational Innovation	Global Comparison	Other: Not specified	Qualitative	Secondary Data	Teaching & Learning
6	[72]	Procedia CIRP	Other: Not specific to a particular region	Policy Gaps	Qualitative	Secondary Data	Teaching & Learning
7	[73]	International Journal of Educational Innovation	Other: Ghana	Other: Not applicable	Mixed-Methods	Other: Focus groups and collection of socio-demographic data	Teaching & Learning

No	Author(s) Year	Journal	Region Focus	Ethical Domain	Study Design	Data Method	Key Issues
8	[74]	Assessment and Evaluation in H...	Other: Not explicitly mentioned in the article.	Other: Not specified	Mixed-Methods	Other: Assessment of student essays using ChatGPT and focus group interviews with university teachers.	Assessment
9	[75]	Computers and Education: Artif...	Other: United Arab Emirates (UAE)	Other: AI Ethics	Quantitative	Survey	Teaching & Learning
10	[57]	Education and Information Tech...	Global Comparison	Policy Gaps	Qualitative	Policy Analysis	Teaching & Learning
11	[55]	XLinguae	Indonesia	Other: Does not explicitly mention	Quantitative	Other: Descriptive statistical analysis, independent sample t-test, and Welch One-Way ANOVA applied to data from 288 students across three universities: Makassar State University, Timor University, and Makassar Health Polytechnic.	Assessment
12	[76]	Computers and Education: Artif...	Global Comparison	Other: AI Literacy	Qualitative	Secondary Data	Teaching & Learning
13	[54]	International Journal of Educa...	Indonesia	Other: AI's impact on creativity and ethical writing	Quantitative	Survey	Teaching & Learning
14	[8]	International Journal of Learn...	Other: China, India, and Indonesia	Policy Gaps	Qualitative	Interview	Teaching & Learning

No	Author(s) Year	Journal	Region Focus	Ethical Domain	Study Design	Data Method	Key Issues
15	[5]	Online Journal of Communicatio...	Other: Discusses global implications	Other: Academic integrity and ethical implications of AI in online assessment	Mixed- Methods	Other:	Assessment
16	[77]	Proceedings - 2023 IEEE/ACM 5t...	Other: Discusses higher education in general	Other: Academic Integrity, Plagiarism Detection, Responsible Use of AI	Qualitative	Secondary Data	Teaching & Learning
17	[78]	Education and Information Tech...	Global Comparison	Other: Not explicitly discussed	Qualitative	Other: Literature Analysis	Teaching & Learning
18	[79]	Societies	Other: Romania	Other: Ethical aspects related to AI implementation	Qualitative	Interview	Teaching & Learning
19	[1]	Cogent Education	Other: Asia	Other: Privacy and Data Security	Quantitative	Survey	Teaching & Learning
20	[56]	International Journal of Artif...	Global Comparison	Other: Neglect of Ethical Considerations in AI Education Policies	Qualitative	Other: Review of 24 National AI Policy Strategies	Other: Policy Development
21	[80]	Interactive Learning Environment ...	Other: Poland / European students	Other: acceptance, ethical consideration, behaviour prediction	Quantitative	Survey	Teaching & Learning
22	[81]	Journal of Applied Learning and...	Other: Australia, New Zealand, United States, and United Kingdom	Other: Academic Integrity	Qualitative	Other: Content Analysis of 100 news articles	Teaching & Learning
23	[82]	Quality Assurance in Education	Other: Bangladesh	Other: Plagiarism and	Quantitative	Survey	Teaching & Learning

No	Author(s) Year	Journal	Region Focus	Ethical Domain	Study Design	Data Method	Key Issues
24	[38]	Economics and Business Review	Global Comparison	Academic Integrity Other: Digital literacy, Ethical use of AI Other: Teachers' psychologi cal factors and attitudes towards AI adoption Other: Digital literacy, Ethical use of AI	Quantitative	Survey	Teaching & Learning
25	[45]	Educational Technology and Soc...	Other: China		Quantitative	Survey	Teaching & Learning
26	[28]	International Journal of Educa...	Global Comparison		Mixed- Methods	Survey	Teaching & Learning

Indonesian-focused studies, such as [8], [54], and [55], predominantly examine specific empirical concerns, including AI's impact on student creativity, text comprehension, and infrastructural readiness. While these studies provide valuable insights into AI adoption practices, they largely treat AI as a pedagogical or technological tool rather than a socio-technical system embedded within broader ethical and governance structures. Consequently, critical issues such as algorithmic bias, data justice, institutional accountability, and regulatory preparedness remain insufficiently theorised within the Indonesian literature. This review addresses this limitation by moving beyond user adoption and technological effectiveness to offer an interdisciplinary examination of ethical risks, governance challenges, and policy implications. By synthesising evidence across algorithmic fairness, data privacy, and accountability, this review provides a more comprehensive analytical framework for understanding the conditions required for responsible AI integration in Indonesian higher education.

Broader critiques, though not Indonesia-specific, by [3], [56], and [57] highlight the global neglect of ethical oversight in national AI strategies. These analyses resonate with Indonesia's own uncoordinated approach, where AI tools are deployed in learning environments without corresponding ethical safeguards, interdisciplinary evaluation, or policy accountability.

One structural weakness is the persistent lack of collaboration between educators, technologists, ethicists, and sociologists. The dominance of survey-based methods over qualitative, community-anchored research limits efforts to articulate context-sensitive ethical frameworks. As noted by Rawas and Saura et al, data transparency remains a critical barrier. Without institutional disclosure, public reporting mechanisms, or participatory oversight, both empirical inquiry and accountability remain constrained [40], [44].

This underrepresentation is not merely an academic concern; it also represents a normative failure that constrains the region's ability to develop culturally resonant AI governance grounded in values such as "collective deliberation", "mutual cooperation", and "communal accountability." Addressing this requires deliberate investment in Southeast Asia's research infrastructure, the promotion of interdisciplinary platforms, and the development of governance models that reflect the region's sociotechnical realities rather than imported ethical templates.

3.2. Discussion

The findings illuminate a confluence of ethical, institutional, and geopolitical factors that shape the implementation and trajectory of AI in higher education, particularly within the Southeast Asian context. As algorithmic systems increasingly mediate academic life, from assessments and admissions to advising and administration, the ethical implications of such interventions transcend mere technical considerations. Instead, they are deeply embedded in questions of institutional responsibility, data

justice, and epistemic representation. This review, grounded in the synthesis of 56 peer-reviewed articles and systematic extraction from Covidence, underscores the pressing need for context-aware ethical frameworks that move beyond universalist narratives rooted in Global North perspective.

The findings further indicate that ethical concerns surrounding AI integration are not isolated technical issues but mutually reinforcing governance challenges shaped by institutional capacity, regulatory readiness, and socio-cultural context.

3.2.1. Policy Implications and Institutional Practice

Addressing RQ2, the reviewed studies consistently recommend participatory governance, algorithmic audits, and privacy-by-design frameworks as key mitigation strategies for mitigating ethical risks associated with AI implementation. The integration of AI technologies in Southeast Asian higher education, particularly in Indonesia, Malaysia, and Vietnam, requires more than infrastructural readiness; it demands robust, ethically grounded governance. The widespread application of algorithmic systems in student admissions, automated grading, and performance analytics has amplified concerns about fairness, transparency, and accountability [58], [59]. These systems are often trained on datasets that inadequately represent the socio-linguistic and educational diversity of Southeast Asian populations, thereby risking the perpetuation of structural inequities.

Scholars have thus called for the institutionalisation of oversight mechanisms, including the establishment of AI ethics committees, routine algorithmic audits, and participatory governance frameworks [31], [34]. These models not only facilitate the early detection of discriminatory patterns but also embed ethical reflexivity into the design, deployment, and monitoring of AI tools. Rather than functioning as technocratic add-ons, these mechanisms should be integrated into the core of AI policy in educational institutions.

The proliferation of AI in personalised learning and adaptive content systems [99], [100] introduces new complexities in data privacy and surveillance [60], [61]. Many Indonesian edtech platforms lack clear consent procedures and long-term data governance protocols. Consequently, students are often unaware of how their behavioural and interactional data are tracked, mined, and repurposed for institutional decision-making [7], [41]. This process of datafication, where learning behaviours are converted into quantifiable metrics, poses serious risks to student autonomy and epistemic agency [35], [36].

To counter these risks, institutions must adopt privacy-by-design approaches, enhance internal data governance frameworks, and implement digital literacy programmes for faculty and students alike [40], [2]. These recommendations align with the findings presented in Table 8, which cross-references key ethical domains, algorithmic fairness, data privacy, and transparency, with targeted mitigations drawn from the literature.

Ethical Domain	Key Risk	Literature Example	Proposed Mitigation
Algorithmic Fairness	Biased admission/grading	[31], [32]	Algorithmic audits; transparent models.
Data Privacy & Security	Consent gaps, student data surveillance	[7], [41]	Privacy-by-design; consent literacy.
Transparency & Governance	Opaque AI systems; lack of stakeholder input	[47], [48]	Participatory design; audit trails.
Contextual Equity	Western-centric models in SEA environments	[34], [58]	Localised ethical frameworks.

Notably, Indonesia lacks a national AI governance framework for education. While Singapore's National AI Strategy (2019) and Malaysia's AI-RMAP 2021-2025 have outlined ethical principles and sector-specific regulation, Indonesia has yet to develop a coordinated roadmap [17], [24]. This regulatory void leaves institutions exposed to operational ambiguity and undermines public trust in educational innovation.

In such a policy vacuum, universities must assume dual roles: as sites of technological implementation and as ethical laboratories for policy experimentation. By piloting contextually embedded models of algorithmic accountability, consent protocols, and inclusive governance, higher

education institutions in Indonesia and the wider region can shape AI adoption in ways that are not only functional but ethically defensible.

3.2.2. Research Gaps and Epistemic Inequality

Addressing RQ3, the findings indicate that the ethical integration of AI in Indonesian higher education depends not only on regulatory coordination and institutional readiness but also on culturally contextualised governance frameworks. A key insight emerging from this review is the persistent epistemic inequality shaping the global AI ethics discourse. Although Southeast Asia has rapidly adopted AI technologies in higher education, the region remains marginal in scholarly debates addressing ethical, social, and cultural dimensions. Of the 56 studies analysed, only a minor subset explicitly engages with Southeast Asian contexts, and even fewer reflect local epistemologies or community-driven perspectives.

In countries such as Indonesia and Vietnam, AI integration spans administrative and pedagogical domains. Yet, regional research often remains technocratic or descriptive, lacking sustained normative critique or reflexive ethical engagement [41], [60], [61]. This limitation constrains Southeast Asia's ability to interrogate imported systems or generate indigenous ethical vocabularies for governance.

Bibliometric co-occurrence mapping further confirms this imbalance. While core terms such as *"student," "privacy,"* and *"fairness"* dominate the literature, no significant cluster is associated with Southeast Asian geographies or cultural references, underscoring the Global North's dominance and the region's discursive invisibility in the production of AI ethics knowledge.

This imbalance reflects the broader pattern of normative dependency, whereby frameworks developed in Western contexts are transplanted without sufficient adaptation to local values, linguistic diversity, or infrastructural inequities [8], [34]. As a result, these governance models often misalign with the lived realities of Southeast Asian educational institutions.

To redress this gap, future research must foster interdisciplinary, community-engaged collaboration between technologists, educators, ethicists, and policy actors. Greater investments in regionally anchored research ecosystems, funding for local scholars, and the development of ethics frameworks rooted in Southeast Asian values are essential. Only through such efforts can Southeast Asia evolve from being a passive policy adopter to becoming an active contributor to AI ethics scholarship, reshaping global narratives on responsible and culturally resonant AI in education.

3.2.3. Towards Contextual Ethical Frameworks

A central limitation of dominant AI governance models lies in their uncritical adoption of Western-centric ethical paradigms, often without contextual adaptation. Grounded in liberal individualism — such as privacy as a property right and accountability as legal liability, these frameworks, though normatively rigorous, frequently misalign with the socio-cultural fabric of Southeast Asia, where ethical reasoning is relational, communal, and embedded in social harmony [58].

In Indonesia, values like *"collective deliberation," "mutual cooperation,"* and *"social responsibility"* serve as normative anchors in both interpersonal and institutional spheres. These values provide an important socio-cultural foundation for context-sensitive AI governance in education, particularly given the growing recognition that ethical AI frameworks must be adapted to local cultural and societal contexts rather than applied as universal models [62], [83]. Such traditions challenge the atomistic assumptions of Global North ethical frameworks and invite a shift toward relational ethics, in which responsibility is shared and wellbeing is co-constructed [8], [34].

Yet, AI implementation in Southeast Asian higher education often reflects policy transplantation, whereby imported edtech platforms and donor-driven compliance models are adopted without evaluating their cultural or institutional fit. This produces policy alienation, where ethical guidelines exist formally but remain disconnected from everyday practices and institutional realities.

Instead of replicating universalist models, higher education institutions in the region should foster hybrid ethical frameworks that blend technological imperatives with local values. These should be: (i) Participatory: co-designed by students, faculty, and administrators; (ii) Contextually equitable, recognising local disparities and needs; (iii) Culturally vernacularized, translating abstract norms into practices intelligible within local ethics. Such models not only enhance local legitimacy but also contribute to global discourses on AI ethics. As [58], [34] argue, integrating Global South perspectives

is vital not only for pluralism, but for dismantling epistemic monocultures that dictate how justice and fairness are operationalised in AI development.

Ultimately, rooting AI ethics in Southeast Asia's sociocultural realities empowers institutions to shift from passive recipients of normative authority to active ethical innovators.

3.2.4. Regional Reflections and Future Directions

Amid growing enthusiasm for AI integration in higher education, Indonesia's regulatory infrastructure remains significantly underprepared to address the ethical challenges posed by these technologies. Currently, no national legal or institutional framework exists to governs the ethical deployment of AI in educational contexts. This regulatory void is increasingly problematic as AI-driven systems, including automated grading, intelligent tutoring, learning analytics, and academic support tools, gain traction across Indonesian universities [60], [61], [63].

Implementation has proceeded through fragmented initiatives, often led by institutional pilots or private sector collaborations, without standardised evaluation criteria or centralised oversight. This ad hoc approach exposes institutions to risks of algorithmic opacity, data misuse, and pedagogical misalignment, especially in marginalised or resource-poor contexts. In contrast, countries such as Singapore and Malaysia have taken decisive steps in embedding ethical considerations into their national AI strategies [17], [24]. As detailed in Table 9, these countries offer comparative benchmarks for Indonesia, particularly in the development of education-specific AI governance instruments.

Table 9. Comparative Summary of National AI Governance Frameworks in ASEAN.

Country	Policy Name	Ethical Guidelines	Education-Specific	Implementation Stage
Singapore	National AI Strategy (2019)	Yes	Yes	Implemented
Malaysia	AI-RMAP 2021-2025	Yes	Partial	Ongoing
Indonesia	–	No	No	Not Yet
Vietnam	National Digital Transformation Plan	Partial	No	Early Phase
Philippines	eGovernment Master Plan	No	No	Preliminary

To address this strategic gap, Indonesia must mobilise coordinated action among core state institutions: KEMENDIKDASMEN, KEMENDIKTISAINTEK, KEMENKEBUD, BRIN, and KOMINFO, to formulate a **“National AI in Education Ethics Charter”**. This charter should be collaboratively developed, drawing on input from universities, civil society, education technologists, ethicists, and student representatives. Rather than replicating global templates, it should reflect Indonesia's socio-cultural values and institutional landscape. Core components should include: (1) Algorithmic transparency and auditability in educational applications; (2) Digital equity and access for underrepresented communities; (3) Participatory governance throughout the AI lifecycle; (4) Robust data protection, including informed consent and long-term oversight. Such a framework would act both as a regulatory safeguard and a normative guide, ensuring AI systems in education are not only effective but also just, inclusive, and culturally embedded.

Regionally, Southeast Asia presents fertile ground for the development of context-sensitive AI ethics. With its linguistic, cultural, and institutional diversity, the region offers a rich laboratory for pluralistic governance models. Rather than adopting passive roles in the global AI landscape, Southeast Asian higher education systems can lead with frameworks rooted in collective ethics, relational accountability, and local wisdom [8], [34].

Ultimately, embedding ethical foresight into national strategies is essential. The future of AI in education will hinge not only on technological sophistication but also on the moral imagination and cultural adaptability of governance systems. Southeast Asia, and Indonesia in particular, have the potential to shape this future, not from the periphery, but from the centre of global ethical innovation.

4. Conclusion

This study critically examined the ethical implications of Artificial Intelligence (AI) integration in Indonesian higher education through a systematic narrative review of 56 peer-reviewed studies. The

findings demonstrate that the most prominent ethical risks associated with AI adoption are algorithmic bias, data privacy vulnerabilities, and limited institutional accountability. These risks are intensified by uneven digital infrastructure, low levels of data governance, and the absence of comprehensive regulatory frameworks governing AI in Indonesian higher education institutions.

The review also identified that most existing governance frameworks and ethical models are predominantly derived from Global North perspectives, with limited adaptation to Southeast Asian socio-cultural and educational realities. Furthermore, the bibliometric and thematic analyses revealed a substantial lack of regionally grounded scholarship, particularly regarding Indonesia, indicating that ethical AI discourse in higher education remains significantly geographically imbalanced.

In response to the research questions, this study finds that ethical AI integration requires not only technical safeguards but also institutional, cultural, and regulatory readiness. Key enabling conditions include transparent algorithmic governance, participatory oversight mechanisms, privacy-by-design approaches, inclusive digital literacy, and ethically grounded culturally contextualised frameworks. The study further highlights the importance of integrating local values such as “*collective deliberation*”, “*mutual cooperation*”, and “*communal responsibility*” into AI governance models within higher education.

Based on these findings, this study proposes the development of a National AI in Education Ethics Charter involving universities, government agencies, civil society, and technology stakeholders. Such a framework would provide ethical guidance for responsible AI deployment by addressing the three core domains identified in this review: algorithmic bias, data privacy and security, and transparency and accountability. Through the establishment of transparent governance mechanisms, ethical auditing procedures, and inclusive stakeholder participation, the Charter could strengthen accountability, protect student rights, and promote fair, equitable, and context-sensitive AI integration within Indonesian higher education.

The contribution of this study lies in its regionally situated perspective on AI ethics in higher education, particularly within the Indonesian and Southeast Asian context. By contextualising global AI governance debates within local socio-political realities, this study contributes to the advancement of more inclusive, culturally responsive, and context-sensitive AI governance frameworks for the Global South. Future research should move beyond predominantly descriptive studies of AI adoption and develop stronger theoretical, ethical, and governance-oriented analyses of AI implementation in higher education. Particular attention should be given to student and educator experiences, institutional governance practices, and the long-term societal implications of AI-driven educational systems, thereby addressing the critical gaps identified in the current Indonesian literature.

Author Contributions

Author Contributions: Y. A. Susanto: Conceptualization, formal analysis, funding acquisition, investigation, methodology, project administration, resources, software, supervision, writing, review & editing. E. Hariadi: Data curation, investigation, resources, software, validation, visualization, writing, original draft. L. Anifah: Investigation, visualization, writing, review & editing. P. Ajie: Investigation, project administration, writing, review & editing.

Acknowledgment

This research was conducted independently without any financial support, and the authors declare no conflicts of interest. We express our sincere gratitude to all individuals and institutions who have provided support, insights, and resources throughout the research process, including academic mentors, colleagues, and reviewers whose valuable contributions have significantly enhanced the quality of this study.

Declaration of Competing Interest

We declare that we have no conflict of interest.

References

- [1] H. U. Rahiman and R. Kodikal, ‘Revolutionizing education: Artificial intelligence empowered learning in higher education’, *Cogent Education*, vol. 11, no. 1, 2024, doi: 10.1080/2331186X.2023.2293431.

- [2] S. V. Singh and K. K. Hiran, 'The Impact of AI on Teaching and Learning in Higher Education Technology', *Journal of Higher Education Theory and Practice*, vol. 22, no. 13, pp. 135-148, 2022, doi: 10.33423/jhetp.v22i13.5514.
- [3] C. K. Y. Chan, 'A comprehensive AI policy education framework for university teaching and learning', *International Journal of Educational Technology in Higher Education*, vol. 20, no. 1, 2023, doi: 10.1186/s41239-023-00408-3.
- [4] H. Crompton and D. Burke, 'Artificial intelligence in higher education: the state of the field', *International Journal of Educational Technology in Higher Education*, vol. 20, no. 1, 2023, doi: 10.1186/s41239-023-00392-8.
- [5] K. Naidu and K. Sevnarayan, 'ChatGPT: An ever-increasing encroachment of artificial intelligence in online assessment in distance education', *Online Journal of Communication and Media Technologies*, vol. 13, no. 3, 2023, doi: 10.30935/ojcm/13291.
- [6] A. Bayaga, 'Leveraging AI-enhanced and emerging technologies for pedagogical innovations in higher education', *Education and Information Technologies*, vol. 30, no. 1, pp. 1045-1072, 2024, doi: 10.1007/s10639-024-13122-y.
- [7] S. Ivanov, M. Soliman, A. Tuomi, N. A. Alkathiri, and A. N. Al-Alawi, 'Drivers of generative AI adoption in higher education through the lens of the Theory of Planned Behaviour', *Technology in Society*, vol. 77, 2024, doi: 10.1016/j.techsoc.2024.102521.
- [8] M. Mustopa, N. Nasikhin, R. Chamami, H. Nihayah, M. R. Habibullah, and A. Manshur, 'Challenges in Artificial Intelligence Development in Higher Education in China, India, and Indonesia: International Students' Perspectives', *International Journal of Learning, Teaching and Educational Research*, vol. 23, no. 2, pp. 354-373, Feb. 2024, doi: 10.26803/ijlter.23.2.17.
- [9] I. Fadhil and A. Sabic-El-Rayess, 'Providing Equity of Access to Higher Education in Indonesia: A Policy Evaluation', *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, vol. 3, no. 1, pp. 57-75, Jan. 2021, doi: 10.23917/ijolae.v3i1.10376.
- [10] R. Aprianto, E. P. Lestari, Sadan, and E. Fletcher, 'Harnessing Artificial Intelligence in Higher Education: Balancing Innovation and Ethical Challenges', *International Transactions on Education Technology (ITEE)*, vol. 3, no. 1, pp. 84-93, Nov. 2024, doi: 10.33050/itee.v3i1.680.
- [11] A. A. Herawati, S. Yusuf, I. Ilfiandra, A. Taufik, and A. S. Ya Habibi, 'Exploring the Role of Artificial Intelligence in Education, Students Preferences and Perceptions', *AL-ISHLAH: Jurnal Pendidikan*, vol. 16, no. 2, pp. 1029-1040, May 2024, doi: 10.35445/alishlah.v16i2.4784.
- [12] M. Urmeneta, 'Reflections on the Artificial Intelligence Transformation: Responsible Use and the Role of Institutional Research and Institutional Effectiveness Professionals', *AIR Professional File*, no. Fall 2023, Dec. 2023, doi: 10.34315/apf1642023.
- [13] N. Mayasari, A. H. M. Sastraatmadja, T. Suparman, I. I. Mutiara, and P. A.-V. Maqfirah, 'Effectiveness of Using Artificial Intelligence Learning Tools and Customized Curriculum on Improving Students' Critical Thinking Skills in Indonesia', *The Eastasouth Journal of Learning and Educations*, vol. 2, no. 02, pp. 111-118, Jul. 2024, doi: 10.58812/else.v2i02.302.
- [14] M. A. J. Mary and Ms. M. Joyce, 'AI and Education: Impact of AI on Learning Outcomes in Higher Education', *International Journal of Scientific Research in Engineering and Management*, vol. 08, no. 008, pp. 1-16, Aug. 2024, doi: 10.55041/IJSREM37145.
- [15] S. A. D. Popenici and S. Kerr, 'Exploring the impact of artificial intelligence on teaching and learning in higher education', *Research and Practice in Technology Enhanced Learning*, vol. 12, no. 1, p. 22, Dec. 2017, doi: 10.1186/s41039-017-0062-8.
- [16] G. Singapore, "National Artificial Intelligence Strategy-Advancing Our Smart Nation Journey," pp. 1-45, 2019, available: <https://www.smartnation.gov.sg/files/publications/national-ai-strategy.pdf>
- [17] MOSTI, 'Malaysia National Artificial Intelligence Roadmap 2021-2025 (AI-RMAP)', Putrajaya, Malaysia, 2021.
- [18] M. Ahmad et al., 'Awareness, benefits, threats, attitudes, and satisfaction with AI tools among Asian and African higher education staff and students', *Journal of Applied Learning & Teaching*, vol. 7, no. 1, Jan. 2024, doi: 10.37074/jalt.2024.7.1.10.

- [19] Y. P. Gyawali and M. Mehandroo, 'Artificial Intelligence in English Language Teaching: Navigating the Future with Emerging Perspectives', *Journal of Language and Linguistics in Society*, no. 26, pp. 21-27, Nov. 2022, doi: 10.55529/jlls.26.21.27.
- [20] T. N. Tran and T. T. Nguyen, "Transforming Language Acquisition: Advanced Artificial Intelligence Approaches for Second Language Education in Asia," Apr. 05, 2024, doi: 10.21203/rs.3.rs-4182646/v1.
- [21] Y. Chen et al., 'Radiology Residents' Perceptions of Artificial Intelligence: Nationwide Cross-Sectional Survey Study', *Journal of Medical Internet Research*, vol. 25, p. e48249, Oct. 2023, doi: 10.2196/48249.
- [22] B. S. Irianto and S. Sutrisno, 'Indonesia's Attitude in Facing the South China Sea Conflict: Policy Analysis and Implications', *EQUALEGUM: International Law Journal*, pp. 59-64, May 2024, doi: 10.61543/equ.v2i2.74.
- [23] I. C. Igbokwe, 'Artificial Intelligence in Educational Leadership: Risks and Responsibilities', *European Journal of Arts, Humanities and Social Sciences*, vol. 1, no. 6, pp. 3-10, Nov. 2024, doi: 10.59324/ejahss.2024.1(6).01.
- [24] J. G. Allen, J. Loo, and J. L. L. Campoverde, 'Governing intelligence: Singapore's evolving AI governance framework', *Cambridge Forum on AI: Law and Governance*, vol. 1, p. e12, Jan. 2025, doi: 10.1017/cfl.2024.12.
- [25] M. B. Hossain, M. H. Miraz, and A. Ya'u, 'From Legality to Responsibility: Charting the Course for AI Regulation in Malaysia', *IIUM Law Journal*, vol. 32, no. 1, pp. 397-429, May 2024, doi: 10.31436/iiumlj.v32i1.927.
- [26] R. P. Wadipalapa, R. Katharina, P. P. Nainggolan, S. Aminah, T. Apriani, D. Ma'rifah, and A. L. Anisah, 'An Ambitious Artificial Intelligence Policy in a Decentralised Governance System: Evidence From Indonesia', *Journal of Current Southeast Asian Affairs*, vol. 43, no. 1, pp. 65-93, 2024, doi: 10.1177/18681034231226393.
- [27] T. Greenhalgh, G. Robert, F. Macfarlane, P. Bate, and O. Kyriakidou, 'Diffusion of Innovations in Service Organizations: Systematic Review and Recommendations', *The Milbank Quarterly*, vol. 82, no. 4, pp. 581-629, Dec. 2004, doi: 10.1111/j.0887-378X.2004.00325.x.
- [28] A. Yusuf, N. Pervin, and M. Román-González, 'Generative AI and the future of higher education: a threat to academic integrity or reformation? Evidence from multicultural perspectives', *International Journal of Educational Technology in Higher Education*, vol. 21, no. 1, 2024, doi: 10.1186/s41239-024-00453-6.
- [29] I. M. García-López, C. S. González González, M. S. Ramírez-Montoya, and J. M. Molina-Espinosa, 'Challenges of implementing ChatGPT on education: Systematic literature review', *International Journal of Educational Research Open*, vol. 8, 2025, doi: 10.1016/j.ijedro.2024.100401.
- [30] J. Luo, 'A critical review of GenAI policies in higher education assessment: a call to reconsider the "originality" of students' work', *Assessment and Evaluation in Higher Education*, vol. 49, no. 5, pp. 651-664, 2024, doi: 10.1080/02602938.2024.2309963.
- [31] A. J. G. Sison, M. T. Daza, R. Gozalo-Brizuela, and E. C. Garrido-Merchán, 'ChatGPT: More Than a "Weapon of Mass Deception" Ethical Challenges and Responses from the Human-Centered Artificial Intelligence (HCAI) Perspective', *International Journal of Human-Computer Interaction*, vol. 40, no. 17, pp. 4853-4872, 2024, doi: 10.1080/10447318.2023.2225931.
- [32] V. Bogina, A. Hartman, T. Kuflik, and A. Shulner-Tal, 'Educating Software and AI Stakeholders About Algorithmic Fairness, Accountability, Transparency and Ethics', *International Journal of Artificial Intelligence in Education*, vol. 32, no. 3, pp. 808-833, 2021, doi: 10.1007/s40593-021-00248-0.
- [33] A. V. Ryabko, T. A. Vakaliuk, O. V. Zaika, R. P. Kukharchuk, I. O. Kukharchuk, and I. V. Novitska, 'A novel neuro-fuzzy approach for evaluating educational programme quality

- and institutional performance in higher education', *CEUR Workshop Proceedings*, vol. 3918, pp. 102–124, 2025, available: <https://ceur-ws.org/Vol-3918/>
- [34] N. Pham, H. Pham Ngoc, and A. Nguyen-Duc, 'Fairness for machine learning software in education: A systematic mapping study', *Journal of Systems and Software*, vol. 219, 2025, doi: 10.1016/j.jss.2024.112244.
- [35] N. Mike, K. Karsai, G. Orbán, A. Bubelényi, C. N. Nagy, and G. Polyák, "The impact of ChatGPT on student performance in higher education," *CEUR Workshop Proceedings*, vol. 3737, 2024, available: <https://ceur-ws.org/Vol-3737/>
- [36] A. Al Ka'bi, 'Proposed artificial intelligence algorithm and deep learning techniques for development of higher education', *International Journal of Intelligent Networks*, vol. 4, pp. 68–73, 2023, doi: 10.1016/j.ijin.2023.03.002.
- [37] Y. Chen, S. Jensen, L. J. Albert, S. Gupta, and T. Lee, 'Artificial Intelligence (AI) Student Assistants in the Classroom: Designing Chatbots to Support Student Success', *Information Systems Frontiers*, vol. 25, no. 1, pp. 161-182, Feb. 2023, doi: 10.1007/s10796-022-10291-4.
- [38] K. Walczak and W. Cellary, 'Challenges for higher education in the era of widespread access to Generative AI', *Economics and Business Review*, vol. 9, no. 2, pp. 71-100, 2023, doi: 10.18559/eb.2023.2.743.
- [39] J. M. Flores-Vivar and F. J. García-Peñalvo, 'Reflections on the ethics, potential, and challenges of artificial intelligence in the framework of quality education (SDG4)', *Comunicar*, vol. 30, no. 74, pp. 35–44, 2023, doi: 10.3916/C74-2023-03.
- [40] J. R. Saura, D. Ribeiro-Soriano, and D. Palacios-Marqués, 'Assessing behavioral data science privacy issues in government artificial intelligence deployment', *Government Information Quarterly*, vol. 39, no. 4, p. 101679, Oct. 2022, doi: 10.1016/j.giq.2022.101679.
- [41] A. S. Nagy, J. R. Tumiwa, F. V. Arie, and L. Erdey, 'An exploratory study of artificial intelligence adoption in higher education', *Cogent Education*, vol. 11, no. 1, Aug. 2024, doi: 10.1080/2331186x.2024.2386892.
- [42] H. C. Chu, G. H. Hwang, Y. F. Tu, and K. H. Yang, 'Roles and research trends of artificial intelligence in higher education: A systematic review of the top 50 most-cited articles', *Australasian Journal of Educational Technology*, vol. 38, no. 3, pp. 22–42, Apr. 2022, doi: 10.14742/ajet.7526.
- [43] T. Rasul et al., 'The role of ChatGPT in higher education: Benefits, challenges, and future research directions', *Journal of Applied Learning and Teaching*, vol. 6, no. 1, pp. 41-56, 2023, doi: 10.37074/jalt.2023.6.1.29.
- [44] S. Rawas, 'ChatGPT: Empowering lifelong learning in the digital age of higher education', *Education and Information Technologies*, vol. 29, no. 6, pp. 6895–6908, 2024, doi: 10.1007/s10639-023-12114-8.
- [45] Y. Wang, C. Liu, and Y. F. Tu, 'Factors Affecting the Adoption of AI Based Applications in Higher Education: An Analysis of Teachers Perspectives Using Structural Equation Modeling', *Educational Technology and Society*, vol. 24, no. 3, pp. 116-129, 2021.
- [46] G. Bilquise, S. Ibrahim, and S. M. Salhieh, 'Investigating student acceptance of an academic advising chatbot in higher education institutions', *Education and Information Technologies*, vol. 29, no. 5, pp. 6357-6382, 2024, doi: 10.1007/s10639-023-12076-x.
- [47] C. McGrath, T. C. Pargman, N. Juth, and P. J. Palmgren, 'University teachers' perceptions of responsibility and artificial intelligence in higher education - An experimental philosophical study', *Computers and Education: Artificial Intelligence*, vol. 4, 2023, doi: 10.1016/j.caeai.2023.100139.
- [48] R. Michel-Villarreal, E. Vilalta-Perdomo, D. E. Salinas-Navarro, R. Thierry-Aguilera, and F. S. Gerardou, 'Challenges and Opportunities of Generative AI for Higher Education as Explained by ChatGPT', *Education Sciences*, vol. 13, no. 9, 2023, doi: 10.3390/educsci13090856.
- [49] J. Morley, L. Kinsey, A. Elhalal, F. Garcia, M. Ziosi, and L. Floridi, 'Operationalising AI ethics: barriers, enablers and next steps', *AI and Society*, vol. 38, no. 1, pp. 411-423, 2023, doi: 10.1007/s00146-021-01308-8.

- [50] Z. Slimi and B. V. Carballido, 'Navigating the Ethical Challenges of Artificial Intelligence in Higher Education: An Analysis of Seven Global AI Ethics Policies', *TEM Journal*, vol. 12, no. 2, pp. 590-602, 2023, doi: 10.18421/TEM122-02.
- [51] J. Rudolph, S. Tan, and S. Tan, 'ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?', *Journal of Applied Learning and Teaching*, vol. 6, no. 1, pp. 342-363, 2023, doi: 10.37074/jalt.2023.6.1.9.
- [52] A. Kelly, M. Sullivan, and K. Strampel, 'Generative artificial intelligence: University student awareness, experience, and confidence in use across disciplines', *Journal of University Teaching and Learning Practice*, vol. 20, no. 6, Aug. 2023, doi: 10.53761/1.20.6.12.
- [53] A. Strzelecki and S. ElArabawy, 'Investigation of the moderation effect of gender and study level on the acceptance and use of generative AI by higher education students: Comparative evidence from Poland and Egypt', *British Journal of Educational Technology*, vol. 55, no. 3, pp. 1209-1230, 2024, doi: 10.1111/bjet.13425.
- [54] A. R. Malik et al., 'Exploring Artificial Intelligence in Academic Essay: Higher Education Student's Perspective', *International Journal of Educational Research Open*, vol. 5, no. nan, p. nan, 2023, doi: 10.1016/j.ijedro.2023.100296.
- [55] J. Juanda and I. Afandi, 'Assessing text comprehension proficiency: Indonesian higher education students vs ChatGPT', *XLinguae*, vol. 17, no. 1, pp. 49-68, 2024, doi: 10.18355/XL.2024.17.01.04.
- [56] D. Schiff, 'Education for AI, not AI for Education: The Role of Education and Ethics in National AI Policy Strategies', *International Journal of Artificial Intelligence in Education*, vol. 32, no. 3, pp. 527-563, 2022, doi: 10.1007/s40593-021-00270-2.
- [57] A. Fernández, B. Gómez, K. Binjaku, and E. K. Meçe, 'Digital transformation initiatives in higher education institutions: A multivocal literature review', *Education and Information Technologies*, vol. 28, no. 10, pp. 12351-12382, 2023, doi: 10.1007/s10639-022-11544-0.
- [58] N. J. Francis, S. Jones, and D. P. Smith, 'Generative AI in Higher Education: Balancing Innovation and Integrity', *British Journal of Biomedical Science*, vol. 81, Jan. 2025, doi: 10.3389/bjbs.2024.14048.
- [59] M. C. Maphalala and O. A. Ajani, 'Leveraging artificial intelligence as a learning tool in higher education', *Interdisciplinary Journal of Education Research*, vol. 7, no. 1, p. a01, 2025, doi: 10.38140/ijer-2025.vol7.1.01.
- [60] K. Aravindh and B. Singh, 'Applications of Artificial Intelligence in Education', in *Next-Generation AI Methodologies in Education*, IGI Global, 2024, pp. 21-40, doi: 10.4018/979-8-3693-7220-3.ch002.
- [61] J. Jor, 'Impact of artificial intelligence on engagement, motivation, work efficiency, and academic outcomes', in *Connecting Ideas, Cultures, and Communities*, London: Routledge, 2025, pp. 511-515, doi: 10.1201/9781003591511-79.
- [62] B. D. Barry, R. Febriani, and M. B. Firmansyah, 'Corporate social responsibility and business ethics in Indonesia: A Scopus-based bibliometric analysis (2005–2025)', *Future Business Journal*, vol. 12, no. 1, pp. 1-19, 2026, doi: 10.1186/s43093-026-00751-7.
- [63] H. M. Ompoc and J. Aguinaldo, 'The Impact of Artificial Intelligence (AI) Integration on Student Engagement and Learning Outcomes of Tertiary Physical Education Students', *Pedagogy Review: An International Journal of Educational Theories, Approaches and Strategies*, vol. 4, no. 1, pp. 80-86, 2024, doi: 10.62718/vmca.pr-ijetas.4.1.SC-1224-006.
- [64] S. Aad and M. Hardey, 'Generative AI: hopes, controversies and the future of faculty roles in education', *Quality Assurance in Education*, vol. 33, no. 2, pp. 267-282, Feb. 2024, doi: 10.1108/QAE-02-2024-0043.
- [65] E. Ferrara, 'Fairness and Bias in Artificial Intelligence: A Brief Survey of Sources, Impacts, and Mitigation Strategies', 2024, doi: 10.3390/sci6010003.
- [66] W. Holmes et al., 'Ethics of AI in Education: Towards a Community-Wide Framework', *International Journal of Artificial Intelligence in Education*, vol. 32, no. 3, pp. 504-526, 2022, doi: 10.1007/s40593-021-00239-1.

- [67] C. Kooli, 'Chatbots in Education and Research: A Critical Examination of Ethical Implications and Solutions', *Sustainability (Switzerland)*, vol. 15, no. 7, 2023, doi: 10.3390/su15075614.
- [68] J. Rudolph, S. Tan, and S. Tan, 'War of the chatbots: Bard, Bing Chat, ChatGPT, Ernie and beyond. The new AI gold rush and its impact on higher education', *Journal of Applied Learning and Teaching*, vol. 6, no. 1, pp. 364-389, 2023, doi: 10.37074/jalt.2023.6.1.23.
- [69] M. Bearman, J. Ryan, and R. Ajjawi, 'Discourses of artificial intelligence in higher education: a critical literature review', *Higher Education*, vol. 86, no. 2, pp. 369-385, 2023, doi: 10.1007/s10734-022-00937-2.
- [70] R. Bucea-Manea-țoniș et al., 'Artificial Intelligence Potential in Higher Education Institutions Enhanced Learning Environment in Romania and Serbia', *Sustainability (Switzerland)*, vol. 14, no. 10, 2022, doi: 10.3390/su14105842.
- [71] D. R. E. Cotton, P. A. Cotton, and J. R. Shipway, 'Chatting and cheating: Ensuring academic integrity in the era of ChatGPT', *Innovations in Education and Teaching International*, vol. 61, no. 2, pp. 228-239, 2024, doi: 10.1080/14703297.2023.2190148.
- [72] Y. Dai, A. Liu, and C. P. Lim, 'Reconceptualizing ChatGPT and generative AI as a student-driven innovation in higher education', 2023, doi: 10.1016/j.procir.2023.05.002.
- [73] H. B. Essel, D. Vlachopoulos, A. B. Essuman, and J. O. Amankwa, 'ChatGPT effects on cognitive skills of undergraduate students: Receiving instant responses from AI-based conversational large language models (LLMs)', *Computers and Education: Artificial Intelligence*, vol. 6, 2024, doi: 10.1016/j.caeai.2023.100198.
- [74] A. Farazouli, T. Cerratto-Pargman, K. Bolander-Laksov, and C. McGrath, 'Hello GPT! Goodbye home examination? An exploratory study of AI chatbots impact on university teachers' assessment practices', *Assessment and Evaluation in Higher Education*, vol. 49, no. 3, pp. 363-375, 2024, doi: 10.1080/02602938.2023.2241676.
- [75] F. Farhi, R. Jeljeli, I. Aburezeq, F. F. Dweikat, S. A. Al-shami, and R. Slamene, 'Analyzing the students' views, concerns, and perceived ethics about chat GPT usage', *Computers and Education: Artificial Intelligence*, vol. 5, 2023, doi: 10.1016/j.caeai.2023.100180.
- [76] M. C. Laupichler, A. Aster, J. Schirch, and T. Raupach, 'Artificial intelligence literacy in higher and adult education: A scoping literature review', *Computers and Education: Artificial Intelligence*, vol. 3, 2022, doi: 10.1016/j.caeai.2022.100101.
- [77] M. Neumann, M. Rauschenberger, and E. M. Schon, '"We Need To Talk About ChatGPT": The Future of AI and Higher Education', 2023, doi: 10.1109/SEENG59157.2023.00010.
- [78] F. Ouyang, M. Wu, L. Zheng, L. Zhang, and P. Jiao, 'Integration of artificial intelligence performance prediction and learning analytics to improve student learning in online engineering course', *International Journal of Educational Technology in Higher Education*, vol. 20, no. 1, 2023, doi: 10.1186/s41239-022-00372-4.
- [79] A. I. Pisica, T. Edu, R. M. Zaharia, and R. Zaharia, 'Implementing Artificial Intelligence in Higher Education: Pros and Cons from the Perspectives of Academics', *Societies*, vol. 13, no. 5, 2023, doi: 10.3390/soc13050118.
- [80] A. Strzelecki, 'To use or not to use ChatGPT in higher education? A study of students' acceptance and use of technology', *Interactive Learning Environments*, vol. 32, no. 9, pp. 5142-5155, 2023, doi: 10.1080/10494820.2023.2209881.
- [81] M. Sullivan, A. Kelly, and P. McLaughlan, 'ChatGPT in higher education: Considerations for academic integrity and student learning', *Journal of Applied Learning and Teaching*, vol. 6, no. 1, pp. 31-40, 2023, doi: 10.37074/jalt.2023.6.1.17.
- [82] M. Tamanna and B. Sinha, 'A conceptual analysis of artificial intelligence (AI) on academic opportunities and challenges: a case study based on higher educational institutions in Bangladesh', *Quality Assurance in Education*, 2024, doi: 10.1108/QAE-03-2024-0050.
- [83] K. Porayska-Pomsta, 'A Manifesto for a Pro-Actively Responsible AI in Education', *International Journal of Artificial Intelligence in Education*, vol. 34, no. 1, pp. 73-83, 2024, doi: 10.1007/s40593-023-00346-1.