MAPPING GLOBAL FRAMEWORKS OF AI GOVERNANCE IN EDUCATION: A SYSTEMATIC POLICY REVIEW

Rizki Amelia[*1,2], Syamsul Hadi[1], Radeni Sukma Indra Dewi[1]
[1]Universitas Negeri Malang, [2]Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia
e-mail: *[1]rizki.amelia.2521039@students.um.ac.id, [2]syamsul.hadi.ft@um.ac.id, [3]radenisukmaindradewi.pasca@um.ac.id

Abstract. *This study presents a systematic literature review (SLR) that analyzes 23 articles and policy documents published between 2020 and 2025, with a focus on AI Governance in Education (AIGE). The main goal of this review was to identify: (1) existing frameworks and policies, (2) the core components of these governance systems, and (3) the similarities and differences in their implementation across various countries. By applying the PRISMA protocol, the analysis integrates global, regional, national, and institutional perspectives to develop an Integrated AIGE Model ultimately. The key findings suggest that the approach to governing AI in education has undergone a significant shift. It has moved away from a purely regulatory control model toward a more multidimensional and participatory ecosystem. This new system is fundamentally built upon ethical, institutional, and collaborative principles. Globally, Frameworks like the UNESCO Recommendation on the Ethics of AI and the OECD AI Principles have established shared, crucial values such as transparency, accountability, fairness, and human-centeredness. Regionally, initiatives such as the ASEAN Guide on AI Governance and Ethics and the African Union's AI Strategy underscore the critical importance of inclusiveness and capacity building. Nationally: High-capacity countries (e.g., Singapore, Korea, Australia) tend to adopt more compliance-oriented models (based on audits and formal regulations). Emerging economies (e.g., India, Indonesia, Nigeria) primarily focus on digital readiness, AI literacy, and ethical awareness as their main priorities. Despite the contextual diversity, there is a strong consensus on the moral foundations (convergence), but a significant divergence in the actual governance structures and enforcement mechanisms. Global North frameworks are typically formalized and audit-based, whereas Global South models are more adaptive, community-oriented, and capacity-driven. Synthesizing these insights, the research proposes the Integrated AIGE Model, which consists of four interconnected dimensions: structural architecture, normative foundations, functional mechanisms, and actor networks. The model emphasizes that sustainable AI governance in education requires hybrid systems that successfully integrate global ethical standards with local contextualization. The overarching aim is to foster innovation that remains equitable, inclusive, and human-centered.*

Keywords. *Artificial Intelligence; AI Governance; Education Policy; Ethics; Higher Education; Systematic Review*

Abstrak. Studi ini menyajikan tinjauan pustaka sistematis (SLR) yang menganalisis 23 artikel dan dokumen kebijakan yang diterbitkan antara tahun 2020 dan 2025, dengan fokus pada Tata Kelola AI dalam Pendidikan (AIGE). Tujuan utama tinjauan ini adalah untuk mengidentifikasi: (1) kerangka kerja dan kebijakan yang ada, (2) komponen inti dari sistem tata kelola ini, dan (3) persamaan dan perbedaan dalam implementasinya di berbagai negara. Dengan menerapkan protokol PRISMA, analisis ini mengintegrasikan perspektif global, regional, nasional, dan kelembagaan untuk mengembangkan Model

AIGE Terpadu pada akhirnya. Temuan utama menunjukkan bahwa pendekatan untuk mengatur AI dalam pendidikan telah mengalami pergeseran yang signifikan. Ini telah bergeser dari model kontrol regulasi murni menuju ekosistem yang lebih multidimensi dan partisipatif. Sistem baru ini pada dasarnya dibangun di atas prinsip-prinsip etika, kelembagaan, dan kolaboratif. Secara global, Kerangka Kerja seperti Rekomendasi UNESCO tentang Etika AI dan Prinsip-Prinsip AI OECD telah menetapkan nilai-nilai bersama yang penting seperti transparansi, akuntabilitas, keadilan, dan berpusat pada manusia. Secara regional, inisiatif seperti Panduan ASEAN tentang Tata Kelola dan Etika AI dan Strategi AI Uni Afrika menggarisbawahi pentingnya inklusivitas dan pengembangan kapasitas. Secara nasional: Negara-negara berkapasitas tinggi (misalnya, Singapura, Korea, Australia) cenderung mengadopsi model yang lebih berorientasi pada kepatuhan (berdasarkan audit dan regulasi formal). Negara-negara berkembang (misalnya, India, Indonesia, Nigeria) terutama berfokus pada kesiapan digital, literasi AI, dan kesadaran etika sebagai prioritas utama mereka. Terlepas dari keragaman kontekstual, terdapat konsensus yang kuat mengenai fondasi moral (konvergensi), tetapi terdapat perbedaan yang signifikan dalam struktur tata kelola dan mekanisme penegakan hukum yang sebenarnya. Kerangka kerja Global Utara biasanya diformalkan dan berbasis audit, sedangkan model Global Selatan lebih adaptif, berorientasi pada komunitas, dan didorong oleh kapasitas. Dengan mensintesis wawasan ini, penelitian ini mengusulkan Model AIGE Terintegrasi, yang terdiri dari empat dimensi yang saling terkait: arsitektur struktural, fondasi normatif, mekanisme fungsional, dan jaringan aktor. Model ini menekankan bahwa tata kelola AI yang berkelanjutan dalam pendidikan membutuhkan sistem hibrida yang berhasil mengintegrasikan standar etika global dengan kontekstualisasi lokal. Tujuan utamanya adalah untuk mendorong inovasi yang tetap adil, inklusif, dan berpusat pada manusia.

Kata Kunci. Artificial Intelligence; Tata Kelola AI; Kebijakan Pendidikan; Etika; Perguruan Tinggi; Systematic Review

A. INTRODUCTION

Information and communication technology has sparked a digital revolution that is fundamentally changing global economic and social systems. This digital transformation is driving the adoption of artificial intelligence in various sectors of society, including education (Lu et al., 2024; Shams et al., 2025). The use of AI in education has the potential to increase governance efficiency, strengthen data-driven decision-making, and enable more adaptive and personalized learning (George & Wooden, 2023). However, the integration of artificial intelligence into the education system also presents new challenges, particularly in terms of ethics, privacy, and social justice (Bu, 2022; Camilleri, 2024a; Dhiman et al., 2025). The use of AI can also pose risks, such as algorithmic bias (Arora et al., 2023), data privacy breach (Ijaiya, 2024; Paul, 2024) and the digital divide between institutions and between countries (Božić, 2023; Kitsara, 2022). As attention to this issue increases, various governments and international organizations have begun to develop AI Governance Frameworks to ensure that the integration of

artificial intelligence into systems can occur ethically, transparently, and accountably (Mirishli, 2025; Sharma et al., 2025).

Since 2017, more than eighty countries have developed national artificial intelligence strategies as an effort to face the global transformation triggered by the Fourth Industrial Revolution, for example the OECD, UNESCO, European Union (Manda & Ben Dhaou, 2019; Park, 2018; Sahai & Rath, 2021). This policy marks the commitment of various countries to utilize artificial intelligence as a catalyst for change in education systems and human resource development (Pedro et al., 2019; Wongmahesak et al., 2025). Governments around the world are now racing to design policy frameworks that encourage the use of AI for educational efficiency and innovation, while ensuring its implementation remains ethical, transparent, and socially just (Lescrauwaet et al., 2022; Schiff, 2022). Thus, this requires a systematic mapping of the AI Governance framework in education to understand patterns, priorities, and policy gaps across countries.

Globally, the necessity of governing AI in the education sector is being increasingly highlighted by major international agendas. These include Sustainable Development Goal 4 (SDG 4) on Quality Education, the United Nations' AI for Good initiative, and the crucial UNESCO Recommendation on the Ethics of Artificial Intelligence. All three initiatives collectively underscore the vital role AI plays in supporting sustainability within education (Lainjo, 2024; Nedungadi et al., 2024). Within this scope, AI transforms into a highly complex public governance challenge, necessitating effective regulation, strong accountability, clear algorithmic transparency, and the robust protection of the rights of both students and educators (Cheong, 2024; Filgueiras, 2024). Consequently, developing sound policies and ethical frameworks for AI in educational settings demands a cross-sectoral and cross-national approach that carefully balances the essential drive for innovation with corresponding social responsibility.

AI governance in education needs to be addressed at three distinct levels: macro, meso, and micro. At the macro level, we're looking at the big picture—governments and global organizations setting wide-reaching policies and regulatory frameworks for how AI is managed within the educational sphere. The meso level deals with institutional policy; this is where bodies like ministries of education or specific educational agencies step in to create detailed guidelines and standards for schools to follow. Finally, the micro level zeroes in on the practical implementation of technology right where it happens: in schools, classrooms, and through the use by individual teachers and students. Since AI has the potential to completely transform how we learn, ensuring these policies are coordinated and aligned across all three levels is absolutely vital for making AI implementation in education both equitable and effectively sustainable (Aggarwal et al., 2023; Amiri, 2025).

Several systematic literature reviews (SLRs) have recently provided valuable insights into various facets of AI governance, focusing on everything from national strategies to ethical terminology and principles. For instance, (Attard-Frost et al., 2024) performed a semi-systematic review that shone a light on Canada's national AI strategy, analyzing 84 governance initiatives and providing concrete suggestions for strengthening the country's approach to AI governance. Separately, (Maas, 2023) tackled the challenge of terminological ambiguity in the field of Advanced AI Governance. His

study sought to classify central definitions and concepts to bring clarity to key terms, ultimately aiming to foster more constructive discussions among relevant stakeholders. In a broader scope, (Corrêa et al., 2023) conducted a meta-analysis of 200 global ethical policies and guidelines related to AI governance, managing to distils and identify 17 core ethical principles recurring across these diverse documents.

While robust studies on general AI governance certainly exist, a significant gap remains concerning the specific regulation of AI within the education sector. Crucially, most prior research has failed to systematically map out existing AI governance policies and frameworks at the macro or cross-national level specifically for education. To directly address this missing piece of the puzzle, this study utilizes a Systematic Literature Review (SLR) designed to comprehensively map AI governance in education (AIGE). Our research is guided by three core questions intended to extract the necessary information from the literature: 1) What are the established policies, strategies, and frameworks for AI governance in the education sector across different countries? 2) What are the main components that constitute AI governance in education? 3) How are AI governance policies in education similar to or different from one another across various national contexts? Answering these questions is vital for generating a deeper, more nuanced understanding of the challenges, opportunities, and relevant policy recommendations for AI governance in the global education landscape.

B. RESEARCH METHODS

To effectively answer the research questions, this study employed the Systematic Literature Review (SLR) method. We chose the SLR approach because it allows for the essential tasks of summarizing, critically evaluating, and synthesizing scientific evidence from a wide array of sources, thereby providing a truly comprehensive overview of this important and evolving subject (Borrego et al., 2014; Petticrew, 2001). This method is crucial for advancing current knowledge by establishing an evidence-based foundation, offering a more objective assessment of past research, and successfully pointing out new directions for future inquiry (Egger & Smith, 2001; Horvath & Pewsner, 2004).

The strength of an SLR lies in its use of rigorous, documented, and structured methods, which ensure the resulting findings are highly valid, reliable, and replicable. As an efficient technique for exploring prior research across large datasets and literature, the SLR is perfectly suited for gathering all relevant evidence concerning AI policies, frameworks, and governance principles in the education sector (Petticrew, 2001; Sawyer, 2015). To guarantee that the review process was carried out with maximum consistency and transparency, this study strictly adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021).

1.   Procedure

The literature search process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework developed by (Page et al., 2021). This procedure includes four main stages: identification, screening, eligibility assessment, and inclusion. The identification stage involves collecting all potential articles from databases. A literature search was conducted using the internationally reputable electronic scientific database Scopus. This database was selected based on ease

of access and relevance to the research topic on artificial intelligence governance in education. The literature search process was completed by the second week of October 2025 to obtain the most recent publications. The search keywords used a combination of the terms AI policy and governance in education with Boolean operations, namely ("artificial intelligence" OR AI) AND (governance OR policy OR regulation OR regulatory OR "public administration" OR "public policy" OR "policy design") AND (education OR "education sector" OR "education system" OR "education policy" OR schools) AND (framework OR guideline* OR strategy OR "national strategy" OR "action plan" OR roadmap).

The search results for these keywords on the Scopus page yielded 3,177 articles. The literature selection process was conducted by applying inclusion and exclusion criteria to the abstracts of the 3,177 articles identified in the initial search stage. The initial selection was based on the year of publication and the relevance of the topic to the research question. Only articles published between 2021 and 2025, in English, and indexed by Scopus were considered for the inclusion stage. Furthermore, only scientific journal articles relevant to the research focus on AI Governance were included in the analysis, while book chapters, reports, and conference proceedings were excluded from consideration. Publications discussing topics outside the context, such as the implementation of AI in learning spaces, the integration of AI in education, and AI governance in non-educational sectors, were also removed from the dataset.

To refine the scope of the SLR, the PICOC (Population, Intervention, Comparison, Outcome, Context) framework was used to define eligibility criteria. This framework systematically guided the formulation of precise inclusion and exclusion criteria, ensuring that only the most pertinent literature for AI governance in educational contexts was selected (Wiboolyasarin et al., 2025). This rigorous process ensures that the selected articles directly contribute to understanding the intricate landscape of global AI governance frameworks in educational settings (Liang et al., 2025). In terms of Population, this study focuses on Scopus-indexed journal articles and official policy documents that specifically discuss AI governance in the education sector, at the global, regional, national, and institutional levels. In terms of Intervention, this study outlines various forms of policy interventions in the form of frameworks, national strategies, ethical guidelines, regulatory instruments, and governance mechanisms implemented to guide the responsible use of AI in the education ecosystem. The Comparison element is applied through comparative analysis across levels (global-regional-national-institutional), across regions (Global North and Global South), and across policy models (hard law and soft governance) to identify variations in approaches and implementation patterns. In terms of Outcome, this study aims to gain a comprehensive understanding of existing AI governance frameworks, synthesize the core components of AI governance in education, analyze points of convergence and divergence between countries, and formulate a conceptual model of the Integrated AIGE Model. Finally, the Context element emphasizes that all analyses are conducted within the context of the education sector, which includes primary and secondary education, higher education, and educational policy-making institutions, with a primary focus on governance aspects rather than on the technical implementation of AI. Thus, the PICOC framework provides a more systematic, consistent and transparent methodological foundation for the entire SLR process. It is explained in Table 1, PICOC Framework.

Applying these criteria to abstracts resulted in 113 articles being selected for full-text review. The same criteria were used to ensure consistency in the full-text screening phase. Of the 113 articles reviewed in full, only 16 met the final criteria after excluding articles that were non-empirical, conceptual opinion pieces, or articles not directly related to AI governance in education.

Table 1. PICOC Framework

| PICOC Element	Description
P - Population	Scopus-indexed journal articles and official policy documents discussing artificial intelligence governance (AI) in the education sector at the global, regional, national, and institutional levels.
I – Intervention	Policy interventions include frameworks, national strategies, ethical guidelines, regulatory instruments, and governance mechanisms that guide the responsible use of AI in the education ecosystem.
C – Comparison	Comparative analysis across levels (global–regional–national–institutional), across regions (Global North vs Global South), and across policy models (hard law vs soft governance) to identify variations in approaches and implementation patterns.
O – Outcome	Identification of existing AI governance frameworks, synthesis of core AIGE components, analysis of points of convergence and divergence between countries, and formulation of a conceptual model of the Integrated AIGE Model.
C – Context	The context of the education sector, including primary and secondary education (K–12), higher education, and educational policy-making institutions, with a primary focus on governance aspects, not the technical aspects of AI implementation.
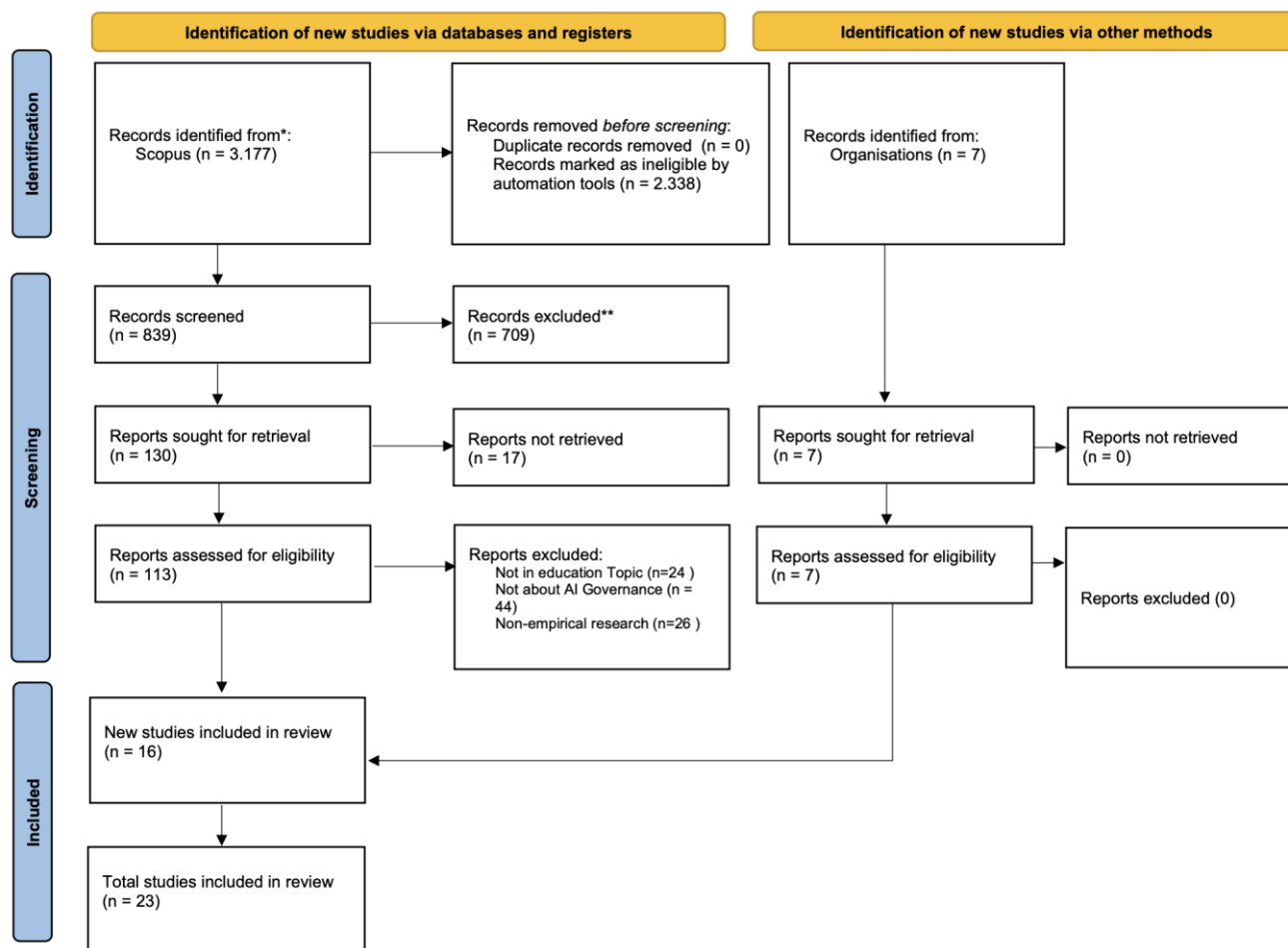
Figure 1. Flowchart Review Selection Process

2. Document Mapping

Following the initial inclusion process, we conducted a meticulous document mapping procedure to integrate relevant formal policy documents and strategic frameworks concerning AI in education. This mapping specifically covered six key policy frameworks: the ASEAN AI Framework, the UNESCO Guidelines, policies from India's AI in Education, Korea's AI Curriculum, Singapore's Governing Framework, Generative AI Strategies in Australian Higher Education, and AI Guidelines for Indonesian Higher Education. We then subjected each of these documents to detailed analysis, categorizing them based on their core governance principles, intended implementation mechanisms, and specific educational focus areas. This systematic approach was essential for facilitating a robust cross-regional comparison and synthesis of the findings.

3. Data Coding dan Analisis

The analysis was executed in four systematic stages. The first stage focused on data extraction and initial coding. We compiled basic information from every selected article into a coding table (Borrego et al., 2014), recording key details such as the publication year, country of origin, the specific type of policy document (e.g., national strategy, ethical guideline), and the educational context of the AI policy (e.g., primary, secondary, or higher education). We also documented the actors involved in policy

development (government, international institutions, educational bodies). This collected data was then organized into two main buckets: study characteristics and policy content.

The second stage was dedicated to developing descriptive themes from these initial codes. We scrutinized each policy document to pinpoint the primary focus and scope of AI governance within its educational setting. The basis for our categories included regulatory domains (such as data, algorithms, curriculum, or ethics), the specific policy focus (e.g., transparency, inclusivity, or teacher capacity), and the level of implementation (national, institutional, or transnational). These groupings were crucial for constructing a robust multi-level governance framework, showing how macro, meso, and micro policies interrelate in managing AI for education.

Moving to the third stage, we built analytical themes to identify consistent governance patterns, emerging ethical principles, and dominant policy approaches across different countries. Articles sharing similar characteristics and policy focuses were grouped together to form key themes, covering areas like institutional structures, policy instruments, ethical frameworks, and implementation strategies. This step was particularly important for observing how global principles, like transparency, accountability, and non-discrimination, were being localized and adapted within national policy contexts. Ultimately, these analytical themes provided a comparative understanding of the direction and priorities of AI governance variations worldwide.

The final stage involved synthesis and validation. We cross-compared the established themes across all countries to identify common principles, pinpoint differences in approaches, and highlight persistent policy gaps. This synthesis culminated in a conceptual map of the AI governance framework in education, clearly illustrating the connections between global policies, national strategies, and institutional practices. To ensure the reliability of our entire analysis, the initial coding process was performed independently by two researchers, and the results were subsequently compared and agreed upon, guaranteeing consistency in interpretation and strengthening the overall validity of our systematic policy review.

4. Research Quality Assessment

To ensure that every study included in our analysis adhered to adequate methodological and academic standards, we performed a thorough article quality assessment. This process adapted a five-criteria framework originally established by (Batool et al., 2025). The five assessment dimensions included: (1) the clarity of the research design and nature, (2) the description of study limitations and future research directions, (3) the clarity of the findings and contributions, (4) the appropriateness of the research design relative to its objectives, and (5) the clarity of the narrative and argumentation presented. Each article that successfully passed the final selection stage was systematically evaluated against these five criteria. Crucially, the assessment confirmed that all analysed articles met the established quality criteria, thereby validating their suitability as a robust basis for conducting a comprehensive thematic synthesis and mapping the governance framework for Artificial Intelligence (AI) in the educational context.

C. RESULT AND DISCUSSION

The research findings present the findings of a systematic literature review on AI-based educational governance, by synthesizing 23 articles published between 2020 and 2025. The selected articles were analysed to identify patterns, principles, and policy frameworks that define how AI is governed in educational contexts at various levels of governance, including global, regional, national, and institutional levels. This synthesis aims to address research questions related to AI policies, strategies, and governance frameworks in the education sector across various countries, as well as the main components of AI governance in education and the similarities and differences in AI governance policies among different countries.

Through a multi-level comparative approach, the findings demonstrate that AI governance in education is evolving from a traditional regulatory paradigm to a multi-layered ecosystem encompassing ethical, participatory, and adaptive governance. The reviewed literature describes diverse pathways through which governments, universities, and international organizations institutionalize ethical norms, coordinate policy actions, and build capacity to ensure the responsible and equitable adoption of AI in education.

1. **AI Governance Policies, Strategies and Frameworks in the Education Sector in Various Countries**

An in-depth analysis of 23 mapped articles reveals that discourse on artificial intelligence (AI) governance in the education sector, both at the global and regional levels, is fundamentally grounded in ethical principles and collaborative practices. However, significant differences were found in implementation approaches, operational contexts, and levels of policy integration across regions.

Globally, particularly in countries of the Global North, such as the United States and Ireland, AI governance in education focuses more on institutionalizing ethics and enforcing professional accountability. Wu et al., (2024) demonstrate this through the design of an AI Governance Framework for higher education institutions in the United States, which positions faculty, IT staff, students, and research offices as key actors in policy formulation based on the principles of transparency, accountability, and fairness. Similarly, Gunes & Liman-Kaban, (2025) examine the AI Ethics Principles Framework, developed through collaboration between experts from Turkey and Ireland, which emphasizes the role of policy ethics as the foundation of academic integrity and the responsible use of AI. However, such formal, standards-oriented governance models tend to operate within a relatively narrow academic space, with very limited involvement from non-academic actors and the community.

In contrast, governance patterns at the regional and national levels in Global South countries show a more inclusive and participatory trend. The African Generative AI Governance Framework, developed by Wakunuma-Zojer & Eke, (2024), clearly emphasizes the importance of social justice and collective engagement, encouraging collaboration among academics, civil society organizations, and policymakers across jurisdictions. A similar approach is evident in Nigeria's Stakeholder-Driven Open Campus Model (Ukeje et al., 2024), which integrates the roles of universities, relevant ministries, and local communities to develop AI education policies tailored to the local social context. This inclusive trend is also evident in the development of the Generative AI Governance Model for Higher Education in ASEAN (Barus et al., 2025), which

emphasizes the principles of Human-Centric AI and places increasing AI literacy as a critical component of implementation. The pattern of multi-stakeholder engagement between the government, higher education institutions, and civil society is also reflected in the findings of studies in Indonesia, Vietnam (Dang et al., 2024), and Africa (Wakunuma-Zojer & Eke, 2024).

Furthermore, research from Kenya and South Africa strongly advocates for the adoption of an AI governance framework that is adaptive and responsive to key challenges such as the digital divide and socioeconomic disparities (Muringa, 2025; Opesemowo & Adekomaya, 2024; Twabu, 2025). Meanwhile, research from the Gulf region and South Asia demonstrates recognition of global ethical norms; however, issues related to policy standardization and harmonization remain unresolved (Albous et al., 2025; Walter, 2024). This often leads to fragmented regulatory landscapes that hinder the consistent application of AI governance principles across diverse educational settings within these regions. In more developed economies, such as the UK, policy comprehensiveness and enforcement mechanisms vary across universities, reflecting diverse institutional priorities and approaches to integrating AI within learning experiences or academic integrity (Atkinson-Toal & Guo, 2024). The academic characteristics of AI guidance within these institutions are often intended to enhance AI literacy and empower the university community to explore AI's potential within a structured framework (Wu et al., 2024). Such frameworks are critical for addressing the inherent challenges of digital disparities, ensuring the reliability of AI-generated content, and mitigating risks associated with data privacy and algorithmic bias (Chun et al., 2025). In contrast, policy frameworks in the Global South frequently integrate broader societal objectives, such as promoting equitable access and fostering local innovation, recognizing the need for flexible, culturally responsive AI frameworks that account for regional disparities in infrastructure and teacher preparedness (Raza et al., 2025; Torres-Rivera et al., 2025).

An extensive synthesis of 23 studies reveals that global AI governance provides a crucial normative foundation for AI policy in the education sector. This foundation is formed by key frameworks such as the UNESCO Recommendation on the Ethics of Artificial Intelligence (Kettemann, 2022), the OECD AI Principles, and the EU AI Law (2021), which collectively promote the creation of a human-centered, rights-based, and transparent AI ecosystem, realized through ethical impact assessments and capacity-building initiatives. Regionally, this standard is further developed in the ASEAN Guidelines on AI Governance and Ethics (ASEAN, 2024), which emphasize interoperability, consensus, and inclusivity, and introduce specific governance components, including internal structures and human oversight mechanisms. At the national level, a variety of implementation models are evident. Singapore's AI Governance Framework and AI Verify Toolkit (Allen et al., 2025) exemplify innovation models oriented toward compliance, transparency, and accountability. In contrast, Australia's GenAI Strategy for Higher Education (TEQSA, 2025) requires universities to formulate AI Action Plans and integrate AI literacy.

Meanwhile, Korea's AI Curriculum and Teacher Education Framework (Lew, 2024) focuses on promoting AI literacy and ethics. Furthermore, initiatives like India's AI Preparedness Framework (Damodaran & Kanwar, 2025) and Indonesia's Generative AI

Guidelines (Kemendikbudristek, 2024) prioritize preparedness and ethics. Even in Africa, frameworks like Wakunuma-Zojer & Eke, (2024) Ubuntu Ethics Model embed cultural values and community participation in AI governance. Taken together, these policies clearly signal a strategic shift from a policy-as-regulation approach to a policy-as-ecosystem approach, integrating ethical norms, institutional capacity building, and participatory mechanisms.

At the institutional level, AI governance in educational settings is increasingly adopting participatory and adaptive approaches, effectively integrating ethical reflection with operational flexibility. In the United States, for example, major universities (Ten Big Universities) have implemented multi-unit governance models (Wu et al., 2024). These models strategically involve key units such as IT departments, teaching and learning centers, and libraries, to ensure academic integrity and student data privacy. Meanwhile, in Europe, the Knowledge-Based AI Governance Model (KB-AIG), proposed by Oncioiu & Bularca, (2025), aims to connect institutional governance with the growing awareness of legal and ethical issues among students. This approach is reinforced by the practice at the University of Technology Sydney (UTS) in Australia, which applies deliberative democracy to policymaking; they collaboratively formulate institutional AI ethics principles through structured deliberations with students and faculty (TEQSA, 2025). In the ASEAN context, similar participatory governance models focus on AI literacy, transparency, and human oversight (ASEAN, 2024). Furthermore, studies from African countries such as Nigeria, South Africa, and Kenya demonstrate that open, multi-stakeholder frameworks are crucial for democratizing AI decision-making processes in education. Taken together, these institutional examples clearly illustrate a fundamental transformation from hierarchical compliance to collaborative governance. This transformation positions universities as ethical laboratories actively cultivating critical digital citizenship.

A synthesis of 23 studies confirms strong convergence on core values, such as transparency, accountability, fairness, inclusivity, privacy, and human-centeredness, that serve as the normative foundation for AI governance in education (Green et al., 2022; Slimi & Carballido, 2023). However, significant divergences emerge in the practical implementation of these values (Torres-Rivera et al., 2025). Frameworks in the Global North tend to be formal, codified, and institutionally limited, offering rigorous ethical benchmarks but often with limited participation from broader societal actors (Torres-Rivera et al., 2025). In contrast, approaches in the Global South are contextual, collaborative, and capacity-driven, prioritizing inclusivity, teacher preparedness, and social equity; however, their implementation is often hindered by resource constraints and infrastructure gaps (Chun et al., 2025; Torres-Rivera et al., 2025). While most of these frameworks are non-binding (Chan, 2023), their effectiveness depends heavily on institutional capacity and political commitment (Chun et al., 2025). Global frameworks are often normative and declarative (OECD, 2023), whereas regional and national frameworks in developing contexts tend to be experimental and adaptive (Torres-Rivera et al., 2025), reflecting a real tension between ethical aspirations and practical feasibility (de-Lima-Santos et al., 2025).

In conclusion, this synthesis highlights significant progress in building the foundations for ethical and collaborative AI governance. However, greater harmonization of global principles with local realities is needed. Regional approaches in

the Global South offer more democratic, participatory, and context-sensitive models, while those in the Global North provide rigorous ethical standards and institutional clarity. Therefore, achieving balanced and sustainable educational AI governance in the future requires cross-regional knowledge exchange, capacity-building partnerships, and the integration of ethical, technical, and social dimensions into a more coherent global framework..

2. Key Components of AI Governance in Education

A synthesis of 23 studies reveals that AI governance in education (AIGE) operates through a multi-layered and polycentric structure, linking global ethical norms with local practices. International organizations, such as UNESCO (Kettemann, 2022), the OECD (OECD, 2023), serve as norm entrepreneurs, establishing key governance principles, including fairness, transparency, and human rights. These normative guidelines are translated into the education sector through initiatives such as UNESCO's AI Competency Framework for Educators. Regionally, frameworks such as the ASEAN Guidelines (ASEAN, 2024) and the African Union Strategy (Wakunuma-Zojer & Eke, 2024) build on these global principles by promoting interoperability and regional capacity building. This multi-level structure creates a polycentric governance system, where responsibilities are shared across governments, institutions, civil society, and the private sector.

From a normative perspective, six ethical principles, such as transparency, accountability, fairness, privacy, inclusivity, and human-centeredness, consistently emerge as foundational to AIGE. However, the operationalization of these values exhibits significant divergences. Institutional frameworks in the Global North (such as the US and Ireland) tend to be formal, codified, and focused on virtue ethics and professional integrity. In contrast, frameworks in the Global South place a greater emphasis on contextual ethics and social justice, such as models that integrate Ubuntu ethics in Africa to ensure equitable access and inclusion. These differences demonstrate that while ethical values are globally convergent, their implementation remains socially adaptive and dependent on cultural context, reflecting the diversity of the educational ecosystem.

Functionally, AIGE governance is supported by four main categories of policy instruments and operational mechanisms: regulation, assessment, capacity building, and collaboration. Regulatory instruments include national and institutional policies (e.g., Singapore's AI Verify Toolkit and Indonesia's Generative AI Guidelines). In contrast, assessment instruments involve Algorithmic Audits and Ethical Impact Assessments (EIAs) to ensure transparency and fairness. Capacity building, such as Korea's AI teacher training and literacy programs, is crucial in developing countries. Finally, collaborative mechanisms, such as the AI Ethics Council and the Deliberative Democracy Forum, facilitate multi-stakeholder participatory decision-making, ensuring broader contributions to policymaking.

AIGE governance inherently involves a multi-actor and interdependent network of actors. At the macro level, intergovernmental organizations define global ethical norms; at the meso level, ministries and governing boards act as orchestrators, translating ethics into implementation strategies. At the micro level, universities, teachers, students, and civil society serve as policy implementers and ethical co-governors, shaping AI practices in the field. The private sector plays a significant technical role, but several

studies caution against uncritical commercial influence, highlighting the importance of transparent partnerships to prevent the commodification of educational ethics. This distribution of authority underscores the polycentric nature of the governance system.

Overall, this synthesis identifies the Integrated AIGE Model, a governance ecosystem that is grounded in ethics, participatory in its processes, adaptive in its functioning, and polycentric in its structure. This model brings together a structural architecture, normative foundations, functional mechanisms, and a network of interdependent actors. While significant progress has been made in developing an ethics-based and collaborative framework, further harmonization between global principles and local realities is still necessary. Achieving balanced and sustainable AI governance in the future requires deeper cross-regional knowledge exchange, capacity-building partnerships, and the integration of ethical, technical, and social dimensions into a coherent global framework.

3. **Similarities and Differences in AI Governance Policies in Education in Various Countries**

A comparative analysis reveals a broad convergence on core ethical principles underlying AI governance in education, regardless of national context or economic capacity. Most countries adopt universal principles, such as transparency, accountability, fairness, privacy, inclusivity, and human-centeredness, as guiding principles for AI policies(Kettemann, 2022; OECD, 2023). This collective ethical commitment is heavily influenced by global frameworks such as the UNESCO Recommendations (Kettemann, 2022), which emphasize human rights and social justice. While the Global North (e.g., Singapore, Korea) is driven by compliance, innovation assurance, and international benchmarking, the Global South (e.g., India, Indonesia) adopts these values to ensure equity, inclusion, and the development of technological capacity. This convergence reflects the diffusion of global ethical norms; however, their implementation remains mediated by contextual adaptation rather than universal enforcement.

Despite similar ethical foundations, significant structural differences are evident in AI governance policies across regions. Countries in the Global North tend to employ formalized and codified governance architectures, characterized by robust regulatory systems, institutional accountability, and professional oversight. Examples include Singapore's AI Verify Toolkit, which integrates technical validation and compliance, or Australia's TEQSA, (2025) risk-based audit mandate. These frameworks emphasize regulatory consistency and technical competence. In contrast, governance in the Global South is more collaborative, flexible, and capacity-driven, often emerging from multi-stakeholder initiatives. Models like Africa's Ubuntu-Based Framework and Nigeria's Open Campus initiative prioritize community participation, ethical inclusivity, and local ownership.

At the institutional level, variations also emerge in the operationalization of AI governance. In Western higher education systems, governance tends to be hierarchical and compliance-driven, with a focus on academic integrity and data governance, as seen in the multi-unit frameworks implemented by major US universities. Similarly, European models aim to connect institutional policies with students' legal and ethical literacy (Oncioiu & Bularca, 2025). In contrast, participatory and adaptive models dominate in the Global South, including the Deliberative Democracy approach at the University of Technology Sydney (UTS) and policy co-production initiatives in ASEAN. These models

redefine AI governance as a collaborative ethical practice, suggesting that the means to achieve shared ethical goals range from bureaucratic enforcement to participatory deliberation.

The main differences between countries lie in the nature and enforcement of policy instruments. Global North frameworks predominantly utilize formal or hard law mechanisms such as legislative acts, data protection laws, and standardized audits (e.g., the EU AI Law), which ensure measurable accountability and legal enforceability. In contrast, Global South frameworks rely heavily on soft governance instruments, namely ethical guidelines, strategic frameworks, and voluntary compliance codes. While this approach allows for flexibility and contextual adaptation, it often faces challenges in enforcement and continuity due to capacity constraints. The emergence of hybrid models, which combine risk-based regulation with ethical guidelines (e.g., Vietnam and Indonesia), is beginning to bridge this gap, marking an evolution toward reflective governance.

In summary, the comparative analysis reveals strong convergence in AIGE's ethical orientation but striking divergences in structural design and policy enforcement. While all systems emphasize responsible and human-centered AI, the Global North tends to be formal, technically sophisticated, and compliance-oriented. At the same time, the Global South is inclusive, adaptive, and capacity-building-oriented. These findings emphasize that effective AI governance is not a single model, but rather a context-sensitive continuum that blends ethical universality with local adaptability. Therefore, a key challenge in the future is harmonizing global ethical norms with local governance realities. Sustainable AI governance requires a hybrid ecosystem, anchored in universal ethics yet responsive to cultural diversity, infrastructure gaps, and pedagogical needs.

D. CONCLUSION

A review of 23 studies shows that AI governance in education (AIGE) has evolved from a mere regulatory framework to an integrated, multidimensional governance ecosystem. This evolution reflects a balance between ethical universality and contextual adaptation. At the global and regional levels, frameworks such as the UNESCO Recommendations (2021) and the ASEAN Guidelines (2024) establish a normative foundation of shared values, including transparency, accountability, equity, and human-centeredness, which serve as ethical anchors for policy design and implementation. Nationally, approaches differ, with developed countries focusing on compliance and technical standards, while developing countries prioritize literacy, equity, and the development of adaptive capacity. At the institutional level, universities serve as ethical laboratories, developing participatory and co-governance frameworks that foster ethical decision-making. While cross-country comparisons reveal strong convergence on moral principles, there are differences in structure and enforcement, with the Global North favoring formal regulation and the Global South favoring flexible, participatory mechanisms. Overall, this study proposes an Integrated AIGE Model comprising four interdependent components: structural architecture, normative foundations, functional mechanisms, and actor networks. From now on, AIGE's success will depend on building a hybrid governance system that aligns global ethics with local realities through cross-regional collaboration and continuous ethical learning, ensuring that AI in education remains innovative and human-centered.

REFERENCE

Aggarwal, D., Sharma, D., & Saxena, A. B. (2023). Exploring the role of artificial intelligence for augmentation of adaptable sustainable education. *Asian Journal of Advanced Research and Reports*, *17*(11), 179–184.

Albous, M., Al-Jayyousi, O. R., & Stephens, M. (2025). AI Governance in the GCC States: A Comparative Analysis of National AI Strategies. *Journal of Artificial Intelligence Research*, *82*, 2389–2422.

Allen, J. G., Loo, J., & Campoverde, J. L. L. (2025). Governing intelligence: Singapore's evolving AI governance framework. *Cambridge Forum on AI: Law and Governance*, *1*, e12. https://www.cambridge.org/core/journals/cambridge-forum-on-ai-law-and-governance/article/governing-intelligence-singapores-evolving-ai-governance-framework/5E54A373E193E2D51354ADC1F509B9B4

Amiri, S. M. H. (2025). The role of artificial intelligence in shaping future education policies. *Available at SSRN 5193088*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5193088

Arora, A., Barrett, M., Lee, E., Oborn, E., & Prince, K. (2023). Risk and the future of AI: Algorithmic bias, data colonialism, and marginalization. In *Information and Organization* (Vol. 33, Issue 3, p. 100478). Elsevier. https://www.sciencedirect.com/science/article/pii/S1471772723000325?casa_token=-_1gOSaOq4UAAAAA:WlxEft7eJBoT3uTbrREdVR98edHfvB2FZTBRNbmNnJOCDu39crT1RetoYLtAM6zMV5-aWS4NBUY

ASEAN. (2024). *ASEAN-Guide-on-AI-Governance-and-Ethics_beautified_201223_v2.pdf*. https://asean.org/wp-content/uploads/2024/02/ASEAN-Guide-on-AI-Governance-and-Ethics_beautified_201223_v2.pdf

Atkinson-Toal, A., & Guo, C. (2024). Generative Artificial Intelligence (AI) Education Policies of UK Universities. *Enhancing Teaching and Learning in Higher Education*, *2*, 70–94.

Attard-Frost, B., Brandusescu, A., & Lyons, K. (2024). The governance of artificial intelligence in Canada: Findings and opportunities from a review of 84 AI governance initiatives. *Government Information Quarterly*, *41*(2), 101929.

Balakrishnan, S., Thongprayoon, C., Wathanavasin, W., Miao, J., Mao, M. A., Craici, I. M., & Cheungpasitporn, W. (2025). Evaluating artificial intelligence bias in nephrology: The role of diversity, equity, and inclusion in AI-driven decision-making and ethical regulation. *Frontiers in Artificial Intelligence*, *8*. Scopus. https://doi.org/10.3389/frai.2025.1525937

Barus, O. P., Hidayanto, A. N., Handri, E. Y., Indra Sensuse, D. I., & Yaiprasert, C. (2025). Shaping generative AI governance in higher education: Insights from student perception. *International Journal of Educational Research Open*, *8*. Scopus. https://doi.org/10.1016/j.ijedro.2025.100452

Batool, A., Zowghi, D., & Bano, M. (2025). AI governance: A systematic literature review. *AI and Ethics*, *5*(3), 3265–3279. https://doi.org/10.1007/s43681-024-00653-w

Borrego, M., Foster, M. J., & Froyd, J. E. (2014). Systematic Literature Reviews in Engineering Education and Other Developing Interdisciplinary Fields. *Journal of Engineering Education*, *103*(1), 45–76. https://doi.org/10.1002/jee.20038

Božić, V. (2023). Risks of digital divide in using Artifical Intelligence (AI). *No. May. Https://Doi.   Org/10.13140/RG*,   2(18156.13443). https://www.researchgate.net/profile/Velibor-Bozic-2/publication/371126516_RISKS_OF_DIGITAL_DIVIDE_IN_USING_ARTIFICAL_INTELLIGENCE_AI/links/688bb47deb16e51129b8cf92/RISKS-OF-DIGITAL-DIVIDE-IN-USING-ARTIFICAL-INTELLIGENCE-AI.pdf

Brezovar, N. (2025). The Role of Artificial Intelligence in NGOs: Challenges and Opportunities for Slovenia's Information Society. *NISPAcee Journal of Public Administration and Policy*, *18*(1), 11–30. Scopus. https://doi.org/10.2478/nispa-2025-0002

Bu, Q. (2022). Ethical risks in integrating artificial intelligence into education and potential countermeasures. *Science Insights*, *41*(1), 561–566.

Camilleri, M. A. (2024a). Artificial intelligence governance: Ethical considerations and implications for social responsibility. *Expert Systems*, *41*(7). Scopus. https://doi.org/10.1111/exsy.13406

Camilleri, M. A. (2024b). Artificial intelligence governance: Ethical considerations and implications for social responsibility. *Expert Systems*, *41*(7). Scopus. https://doi.org/10.1111/exsy.13406

Chan, C. K. Y. (2023). A comprehensive AI policy education framework for university teaching and learning. *International Journal of Educational Technology in Higher Education*, *20*(1), 38. https://doi.org/10.1186/s41239-023-00408-3

Cheong, B. C. (2024). Transparency and accountability in AI systems: Safeguarding wellbeing in the age of algorithmic decision-making. *Frontiers in Human Dynamics*, *6*, 1421273.

Chun, J., Kim, J., Kim, H., Lee, G., Cho, S., Kim, C., Chung, Y., & Heo, S. (2025). A comparative analysis of on-device AI-driven, self-regulated learning and traditional pedagogy in university health sciences education. *Applied Sciences*, *15*(4), 1815.

Corrêa, N. K., Galvão, C., Santos, J. W., Del Pino, C., Pinto, E. P., Barbosa, C., Massmann, D., Mambrini, R., Galvão, L., & Terem, E. (2023). Worldwide AI ethics: A review of 200 guidelines and recommendations for AI governance. *Patterns*, *4*(10). https://www.cell.com/patterns/fulltext/S2666-3899(23)00241-6

Damodaran, A., & Kanwar, S. (2025). *AI in school education: Towards a preparedness framework*. Centre for Internet and Digital Economy. Available at: https://mit-genai ….

Dang, H. B., Pham, T. T. Q., Nguyen, V. P., & Nguyen, V. H. (2024). Regulatory impact of a governmental approach for artificial intelligence technology implementation in Vietnam. *Journal of Infrastructure, Policy and Development*, *8*(11). Scopus. https://doi.org/10.24294/jipd.v8i11.6631

de-Lima-Santos, M.-F., Yeung, W. N., & Dodds, T. (2025). Guiding the way: A comprehensive examination of AI guidelines in global media. *AI & SOCIETY*, *40*(4), 2585–2603. https://doi.org/10.1007/s00146-024-01973-5

Dhiman, T., Chauhan, V., Kumar, A., Vasantha, M., & Kumar, A. (2025). *Ethical Crossroads: Navigating Data Privacy, Bias, Accountability and Sustainability in AI-Driven Education*. https://www.researchgate.net/profile/Vishakha-Chauhan-8/publication/393168074_Ethical_Crossroads_Navigating_Data_Privacy_Bias_Accountability_and_Sustainability_in_AI-Driven_Education/links/6866f0f1b991270ef30165de/Ethical-Crossroads-Navigating-Data-Privacy-Bias-Accountability-and-Sustainability-in-AI-Driven-Education.pdf

Egger, M., & Smith, G. D. (2001). Principles of and Procedures for Systematic Reviews. In M. Egger, G. D. Smith, & D. G. Altman (Eds.), *Systematic Reviews in Health Care* (1st ed., pp. 23–42). Wiley. https://doi.org/10.1002/9780470693926.ch2

Filgueiras, F. (2024). Artificial intelligence and education governance. *Education, Citizenship and Social Justice*, *19*(3), 349–361. https://doi.org/10.1177/17461979231160674

George, B., & Wooden, O. (2023). Managing the strategic transformation of higher education through artificial intelligence. *Administrative Sciences*, *13*(9), 196.

Green, E., Singh, D., & Chia, R. (2022). *AI ethics and higher education: Good practice and guidance for educators, learners, and institutions*. Globethics. net.

Gunes, A., & Liman-Kaban, A. L. (2025). A Delphi Study on Ethical Challenges and Ensuring Academic Integrity Regarding AI Research in Higher Education. *Higher Education Quarterly*, *79*(4). Scopus. https://doi.org/10.1111/hequ.70057

Horvath, A. R., & Pewsner, D. (2004). Systematic reviews in laboratory medicine: Principles, processes and practical considerations. *Clinica Chimica Acta*, *342*(1–2), 23–39.

Ibrahim, S. M., Al Shraideh, M. A., Leiner, M., AlDajani, I. M., & Ouarda, B. (2024). Artificial intelligence ethics: Ethical consideration and regulations from theory to practice. *IAES International Journal of Artificial Intelligence*, *13*(3), 3703–3714. Scopus. https://doi.org/10.11591/ijai.v13.i3.pp3703-3714

Ijaiya, H. (2024). Harnessing AI for data privacy: Examining risks, opportunities and strategic future directions. *Int. J. Sci. Res. Arch*, *13*, 2878–2892.

Kemendikbudristek. (2024). *PANDUAN PENGGUNAAN GENERATIVE ARTIFICIAL INTELLIGENCE (GenAI) PADA PEMBELAJARAN DI PERGURUAN TINGGI*. https://repositori.kemendikdasmen.go.id/32289/1/Buku%20Panduan%20Peng

gunaan%20Generative%20AI%20pada%20Pembelajaran%20di%20Perguruan%2 0Tinggi%20ver1.1.pdf

Kettemann, D. M. C. (2022). UNESCO Recommendation on the Ethics of Artificial Intelligence. *Conditions for the Implementation in Germany*.

Kitsara, I. (2022). Artificial Intelligence and the Digital Divide: From an Innovation Perspective. In A. Bounfour (Ed.), *Platforms and Artificial Intelligence* (pp. 245–265). Springer International Publishing. https://doi.org/10.1007/978-3-030-90192-9_12

Lainjo, B. (2024). The role of artificial intelligence in achieving the United Nations sustainable development goals. *Journal of Sustainable Development*, *17*(5), 1–30.

Lescrauwaet, L., Wagner, H., Yoon, C., & Shukla, S. (2022). Adaptive legal frameworks and economic dynamics in emerging tech-nologies: Navigating the intersection for responsible innovation. *Law and Economics*, *16*(3), 202–220.

Lew, H. (2024). *Artificial Intelligence (AI) Teacher Education in Korea*. https://tsukuba.repo.nii.ac.jp/record/2013463/files/JSAE_2020-2-119.pdf

Liang, J., Stephens, J. M., & Brown, G. T. (2025). A systematic review of the early impact of artificial intelligence on higher education curriculum, instruction, and assessment. *Frontiers in Education*, *10*, 1522841. https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2025.1 522841/full

Lu, Q., Zhu, L., Xu, X., Whittle, J., Zowghi, D., & Jacquet, A. (2024). Responsible AI Pattern Catalogue: A Collection of Best Practices for AI Governance and Engineering. *ACM Computing Surveys*, *56*(7), 1–35. https://doi.org/10.1145/3626234

Maas, M. M. (2023). Concepts in advanced AI governance: A literature review of key terms and definitions. *AI Foundations Report*, *3*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4612473

Mahrishi, M., Abbas, A., & Siddiqui, M. K. (2025). Global Initiatives Towards Regulatory Frameworks for Artificial Intelligence (AI) in Higher Education. *Digital Government: Research and Practice*, *6*(2). Scopus. https://doi.org/10.1145/3672462

Manda, M. I., & Ben Dhaou, S. (2019). Responding to the challenges and opportunities in the 4th Industrial revolution in developing countries. *Proceedings of the 12th International Conference on Theory and Practice of Electronic Governance*, 244–253. https://doi.org/10.1145/3326365.3326398

Mariyono, D., & Hidayatullah, A. N. (2025). Navigating the Moral Maze: Ethical Challenges and Opportunities of Generative Chatbots in Global Higher Education. *Applied Computational Intelligence and Soft Computing*, *2025*(1). Scopus. https://doi.org/10.1155/acis/8584141

Mirishli, S. (2025). *The Role of Legal Frameworks in Shaping Ethical Artificial Intelligence Use in Corporate Governance* (arXiv:2503.14540). arXiv. https://doi.org/10.48550/arXiv.2503.14540

Muringa, T. P. (2025). Exploring ethical dilemmas and institutional challenges in AI adoption: A study of South African universities. *Frontiers in Education*, *10*, 1628019. https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2025.1628019/abstract

Nedungadi, P., Tang, K.-Y., & Raman, R. (2024). The transformative power of generative artificial intelligence for achieving the sustainable development goal of quality education. *Sustainability*, *16*(22), 9779.

OECD. (2023). *Scoping the OECD AI principles*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/02/advancing-accountability-in-ai_753bf8c8/2448f04b-en.pdf?utm_source=chatgpt.com

Oncioiu, I., & Bularca, A. R. (2025). Artificial Intelligence Governance in Higher Education: The Role of Knowledge-Based Strategies in Fostering Legal Awareness and Ethical Artificial Intelligence Literacy. *Societies*, *15*(6). Scopus. https://doi.org/10.3390/soc15060144

Opesemowo, O. A. G., & Adekomaya, V. (2024). Harnessing artificial intelligence for advancing sustainable development goals in South Africa's higher education system: A qualitative study. *International Journal of Learning, Teaching and Educational Research*, *23*(3), 67–86.

Page, A., Charteris, J., Anderson, J., & Boyle, C. (2021). Fostering school connectedness online for students with diverse learning needs: Inclusive education in Australia during the COVID-19 pandemic. *European Journal of Special Needs Education*, *36*(1), 142–156.

Park, S.-C. (2018). The Fourth Industrial Revolution and implications for innovative cluster policies. *AI & SOCIETY*, *33*(3), 433–445. https://doi.org/10.1007/s00146-017-0777-5

Paul, J. (2024). Privacy and data security concerns in AI. *ResearchGate, November*. https://www.researchgate.net/profile/Joel-Paul-10/publication/385781993_Privacy_and_data_security_concerns_in_AI/links/6734ffe2f255d5728669d3a3/Privacy-and-data-security-concerns-in-AI.pdf

Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). *Artificial intelligence in education: Challenges and opportunities for sustainable development*. https://repositorio.minedu.gob.pe/handle/20.500.12799/6533

Petticrew, M. (2001). Systematic reviews from astronomy to zoology: Myths and misconceptions. *Bmj*, *322*(7278), 98–101.

Putra, B. A. (2024). Governing AI in Southeast Asia: ASEAN's way forward. *Frontiers in Artificial Intelligence*, *7*. Scopus. https://doi.org/10.3389/frai.2024.1411838

Raza, F. A., Singh, A. D., Kovilpillai, J. J. S., Hamdan, A., & Rajaratnam, V. (2025). Safeguarding Integrity in AI-Enhanced Education: Stakeholder Perspectives on Accuracy, Validity, and Ethics in ASEAN. *European Journal of STEM Education*, *10*(1), 22.

Sahai, A. K., & Rath, N. (2021). Artificial intelligence and the 4th industrial revolution. In *Artificial intelligence and machine learning in business management* (pp. 127–143). CRC Press. https://www.taylorfrancis.com/chapters/edit/10.1201/9781003125129-8/artificial-intelligence-4th-industrial-revolution-alok-kumar-sahai-namita-rath

Sawyer, K. (2015). A call to action: The challenges of creative teaching and learning. In *Teachers College Record* (Vol. 117, Issue 10).

Schiff, D. (2022). 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*, 32(3), 527–563. https://doi.org/10.1007/s40593-021-00270-2

Shams, R. A., Zowghi, D., & Bano, M. (2025). AI and the quest for diversity and inclusion: A systematic literature review. *AI and Ethics*, 5(1), 411–438. https://doi.org/10.1007/s43681-023-00362-w

Sharma, R., Haralayya, D. B., Maria H, H., Murthy, B. S. R., & Vadisetty, R. (2025). Corporate Governance and AI Ethics: A Strategic Framework for Ethical Decision-Making in Business. *Corporate Governance and AI Ethics: A Strategic Framework for Ethical Decision-Making in Business (February 27, 2025).* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5270919

Slimi, Z., & Carballido, B. V. (2023). Navigating the Ethical Challenges of Artificial Intelligence in Higher Education: An Analysis of Seven Global AI Ethics Policies. *TEM Journal*, 12(2). https://www.ceeol.com/search/article-detail?id=1122977

Swist, T., Buckingham Shum, S., & Gulson, K. N. (2024). Co-producing AIED Ethics Under Lockdown: An Empirical Study of Deliberative Democracy in Action. *International Journal of Artificial Intelligence in Education*, 34(3), 670–705. Scopus. https://doi.org/10.1007/s40593-023-00380-z

TEQSA. (2025). Gen AI strategies for research training: Emerging practice. *Australian Government - Tertiary Education and Standard Agency*.

Torres-Rivera, A. D., Rendón Peña, A. A., Díaz-Torres, S. T., & Díaz-Torres, L. A. (2025). Ethical integration of AI and STEAM pedagogies in higher education: A sustainable learning model for society 5.0. *Sustainability*, 17(19), 8525.

Twabu, K. (2025). Investigating schumpeter's innovation theory in the context of AI in higher education research. *Discover Education*, 4(1), 389. https://doi.org/10.1007/s44217-025-00855-2

Ukeje, I. O., Elom, C. O., Ayanwale, M. A., Umoke, C. C., & Nwangbo, S. O. (2024). Exploring an Innovative Educational Governance Framework: Leveraging Artificial Intelligence in a Stakeholder-Driven "Open Campus Model" in South East Nigerian Universities. *International Journal of Learning, Teaching and Educational Research*, 23(6), 416–440. Scopus. https://doi.org/10.26803/ijlter.23.6.19

Ulnicane, I., Eke, D., Knight, W., Ogoh, G., & Stahl, B. C. (2021). Good governance as a response to discontents? Déjà vu, or lessons for AI from other emerging

technologies. *Interdisciplinary Science Reviews*, 46(1–2), 71–93. Scopus. https://doi.org/10.1080/03080188.2020.1840220

Wakunuma-Zojer, K., & Eke, D. (2024). Africa, ChatGPT, and Generative AI Systems: Ethical Benefits, Concerns, and the Need for Governance. *Philosophies*, *9*(3). Scopus. https://doi.org/10.3390/philosophies9030080

Walter, Y. (2024). Managing the race to the moon: Global policy and governance in Artificial Intelligence regulation—A contemporary overview and an analysis of socioeconomic consequences. *Discover Artificial Intelligence*, *4*(1), 14. https://doi.org/10.1007/s44163-024-00109-4

Wiboolyasarin, W., Wiboolyasarin, K., Tiranant, P., Jinowat, N., & Boonyakitanont, P. (2025). AI-driven chatbots in second language education: A systematic review of their efficacy and pedagogical implications. *Ampersand*, *14*, 100224.

Wongmahesak, K., Karim, F., & Wongchestha, N. (2025). Artificial Intelligence: A Catalyst for Sustainable Effectiveness in Compulsory Education Management. *Asian Education and Learning Review*, *3*(1), 4–4.

Wu, C., Zhang, H., & Carroll, J. M. (2024). AI Governance in Higher Education: Case Studies of Guidance at Big Ten Universities. *Future Internet*, *16*(10). Scopus. https://doi.org/10.3390/fi16100354

Appendix – Included Study

Author	Title
(Gunes & Liman-Kaban, 2025)	A Delphi Study on Ethical Challenges and Ensuring Academic Integrity Regarding AI Research in Higher Education.
(Wakunuma-Zojer & Eke, 2024)	Africa, ChatGPT, and Generative AI Systems: Ethical Benefits, Concerns, and the Need for Governance.
(Wu et al., 2024)	AI Governance in Higher Education: Case Studies of Guidance at Big Ten Universities.
(Barus et al., 2025)	Shaping generative AI governance in higher education: Insights from student perception.
(Ukeje et al., 2024)	Exploring an Innovative Educational Governance Framework: Leveraging Artificial Intelligence in a Stakeholder-Driven "Open Campus Model" in South East Nigerian Universities.
(Ibrahim et al., 2024)	Artificial intelligence ethics: Ethical consideration and regulations from theory to practice.
(Mahrishi et al., 2025)	Global Initiatives Towards Regulatory Frameworks for Artificial Intelligence (AI) in Higher Education.
(Mariyono & Hidayatullah, 2025)	Navigating the Moral Maze: Ethical Challenges and Opportunities of Generative Chatbots in Global Higher Education.
(Putra, 2024)	Governing AI in Southeast Asia: ASEAN's way forward
(Balakrishnan et al., 2025)	Evaluating artificial intelligence bias in nephrology: The role of diversity, equity, and inclusion in AI-driven decision-making and ethical regulation.
(Ulnicane et al., 2021)	Good governance as a response to discontents? Déjà vu, or lessons for AI from other emerging technologies.
(Dang et al., 2024)	Regulatory impact of a governmental approach for artificial intelligence technology implementation in Vietnam.
(Swist et al., 2024)	Co-producing AIED Ethics Under Lockdown: An Empirical Study of Deliberative Democracy in Action.
(Oncioiu & Bularca, 2025)	Artificial Intelligence Governance in Higher Education: The Role of Knowledge-Based Strategies in Fostering Legal Awareness and Ethical Artificial Intelligence Literacy.
(Camilleri, 2024b)	Artificial intelligence governance: Ethical considerations and implications for social responsibility.
(Brezovar, 2025)	The Role of Artificial Intelligence in NGOs: Challenges and Opportunities for Slovenia's Information Society.

(ASEAN, 2024)	Asean Guide on AI Governance and Ethics
(Damodaran & Kanwar, 2025)	AI in School Education: Towards a Preparedness Framework
(Lew, 2024)	Artificial Intelligence (AI) Teacher Education in Korea
(Allen et al., 2025)	Governing Intelligence: Singapore's Evolving AI Governance Framework
(TEQSA, 2025)	Gen AI Strategies for Australian Higher Education: Emerging Practice
(Kettemann, 2022)	UNESCO Recommendation on the Ethics of Artificial Intelligence
(Kemendikbudristek, 2024)	Buku Panduan Penggunaan Generative AI pada Pembelajaran di Perguruan Tinggi