



Explaining Cross-National Variations in AI Policy Enactment: Indonesia, Finland, and South Korea

Muh Fitrah^{1*} , Ruslan² , Luthfiyah² , Umar² , Mei Indra Jayanti³ , Israfil³, Sudarmin³, Fathurrahman², Aminullah³

¹ Independent Researcher, Bima, INDONESIA

² Universitas Muhammadiyah Bima, INDONESIA

³ Universitas Nggusuwaru, INDONESIA

* Correspondence: fitrahmath@gmail.com

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ABSTRACT

The development of artificial intelligence in education has outpaced the institutionalisation of policies governing its use, accountability, and implementation. Cross-national scholarship remains dominated by discussions of adoption, pedagogical opportunities, and ethical risks, while variation in policy enactment across national education systems remains underexplained. This study examines artificial intelligence policy enactment in Indonesia, Finland, and South Korea through a comparative qualitative policy analysis of 22 core and supporting policy documents. The analysis focused on policy orientation, the locus of enactment authority, regulatory-ethical institutionalisation, and implementation mode. The findings show that the main differences across the three systems do not lie in technology adoption itself, but in the logic through which policy is enacted. Indonesia demonstrates capacity-led enactment shaped by gradual implementation and teacher capacity building. Finland demonstrates regulatory-literacy enactment mediated by education providers and structured through regulation, ethics, and AI literacy. South Korea demonstrates scaled rollout enactment driven by state direction, infrastructure support, and personalised learning reform. The study proposes a three-part typology comprising capacity-led enactment, regulatory-literacy enactment, and scaled rollout enactment, and argues that cross-national variation in artificial intelligence policy in education is best explained through the arrangement of authority, regulatory-ethical institutionalisation, and implementation instruments.

Keywords: comparative education; policy enactment; education governance; artificial intelligence in education; digital transformation

INTRODUCTION

The development of artificial intelligence in education has outpaced the institutionalisation of policies governing its use, accountability, and implementation within education systems. Artificial intelligence is no longer positioned merely as a technical support tool; it has entered teaching, assessment, materials

development, personalised learning, and data-driven decision-making. This development has shifted attention from pedagogical innovation towards education governance encompassing pedagogical, ethical, institutional, and policy dimensions (Cifuentes, 2015; Holmes et al., 2022; Hwang et al., 2020; Li & Zhang, 2025). The central issue is therefore no longer confined to the use of technology itself, but to how its use is governed, who holds implementation authority, and how educational rights are protected when technological change advances more rapidly than policy capacity can regulate it.

Data privacy, algorithmic bias, accountability, transparency, human oversight, and inequalities of access position artificial intelligence in education as a governance issue that cannot be reduced to a merely technical matter. These concerns are directly linked to educational justice, the quality of pedagogical decision-making, and institutional responsibility (Alfiras et al., 2026; Holmes et al., 2022; Nguyen et al., 2023). At the same time, guidelines, and policies on the use of artificial intelligence have developed in fragmented ways and are often not accompanied by clear implementation mechanisms at the institutional level (Chan, 2023; Filgueiras, 2024; Funa & Gabay, 2025). The issue, therefore, is not the presence of artificial intelligence itself, but its translation into policies that can be operationalised.

The push for technological adoption is also not always accompanied by the readiness of education systems to govern it. Teachers and educational institutions often face demands to use technology without adequate professional support, policy clarity, or sufficient ethical and pedagogical capacity. Scholarship on artificial intelligence in education has thus far been dominated by two broad strands. The first emphasises pedagogical potential and effectiveness in learning, while the second highlights ethical risks and the need for responsible governance. Both strands are important, yet they remain insufficient for explaining how national policies are formed, institutionalised, and enacted across different education systems. Attention continues to be directed more towards technological capacities, associated risks, and actor readiness than towards the location of policy authority, the institutionalisation of regulation and ethics, and the implementation instruments that generate cross-national variation.

This gap is also evident in the publication landscape. A Scopus search conducted by the authors for the period 2018–2026 showed that the broader domain of artificial intelligence in education generated substantially more publications than studies explicitly addressing policy, governance, regulation, implementation, accountability, and ethics. When the search was narrowed further to studies linking artificial intelligence in education with policy enactment, only a very small body of work was identified. This pattern suggests that the literature remains more concentrated on the uses and implications of artificial intelligence in education than on the processes through which policy is translated and enacted across different national contexts. To improve transparency, the Scopus search procedure and search string are reported in the supplementary material.

In comparative readings, cross-national differences also continue to be explained largely through variations in policy content, levels of readiness, or normative orientation (Kundu & Bej, 2025; Parker et al., 2025). Such explanations do not sufficiently capture difference as variation in the logic of policy enactment. As a result, cross-national differences are often read as differences in the level of adoption, the depth of regulation, or the advancement of implementation, whereas what is more decisive is how global agendas are translated into national policy orientations, how enactment authority is positioned, the extent to which regulation and ethics are institutionalised, and through what implementation modalities policy is carried out.

In this study, policy enactment is understood not as the straightforward implementation of a policy text, but as the process through which policy is interpreted, mediated, translated, negotiated, and made operational through actors, institutions, capacities, regulatory arrangements, and implementation instruments (Braun et al., 2010, 2011). This distinction is important because implementation often implies the execution of already settled policy intentions, whereas enactment draws attention to the situated processes through which policy acquires meaning, authority, and practical form. Within comparative and international education, the issue is not simply the movement of policy across contexts, but the transformations it undergoes when entering

different national systems (Cowen, 2009; Crossley & Watson, 2009). Artificial intelligence in education therefore needs to be understood through the relationship between global agendas, national policy orientations, the distribution of enactment authority, and the forms of implementation that emerge within education systems.

On this basis, differences in artificial intelligence policy in education across countries are more appropriately understood as variations in the logic of policy enactment than as differences in levels of technological adoption. The analytical focus therefore shifts from technology as the object of policy to governance as the structure shaping how policy is translated and enacted. This shift enables a sharper reading of the relationship between authority, regulatory-ethical institutionalisation, and implementation instruments in explaining policy variation across contexts.

Indonesia, Finland, and South Korea were selected because each displays a distinct configuration of enactment and offers strong comparative value. More specifically, the three cases were selected as analytically contrasting configurations of AI policy enactment rather than as stages in a developmental hierarchy. Indonesia represents a configuration in which enactment is initiated by the state and advanced through gradual capacity building in conditions of uneven institutional readiness. Finland represents a configuration in which enactment is strongly mediated by education providers within a layered framework of regulation, ethics, and AI literacy. South Korea represents a configuration in which enactment is state-directed, infrastructure-supported, and operationalised through large-scale rollout. The comparison is therefore intended not to identify the “best” model, but to explain why similar global agendas are enacted through different governance arrangements.

Against this background, this study analyses artificial intelligence policy in education in Indonesia, Finland, and South Korea through the lens of policy enactment. It focuses analytically on three differentiating axes: the locus of enactment authority, the degree of regulatory-ethical institutionalisation, and the mode of policy implementation. By doing so, the study extends policy enactment scholarship in two ways. First, it brings policy enactment more explicitly into the study of artificial intelligence governance in education, a field still dominated by adoption-oriented and ethics-oriented discussions. Second, it develops an analytical typology of cross-national variation comprising capacity-led enactment, regulatory-literacy enactment, and scaled rollout enactment, showing that differences across education systems are better understood as differences in enactment structure than as differences in technological advancement alone.

Research Questions

1. How are global agendas on artificial intelligence in education translated into national policy orientations in Indonesia, Finland, and South Korea?
2. How is AI policy enactment configured through the roles of the state, educational institutions, and teachers in Indonesia, Finland, and South Korea?
3. How do regulation, ethics, and implementation modalities shape variations in AI policy enactment across Indonesia, Finland, and South Korea?
4. How do the three cases differ in their overall logic of AI policy enactment, and what analytical pattern emerges from this comparison?

METHOD

Research Design

This study employed a comparative qualitative policy analysis design based on document analysis (Fischer & Maggetti, 2017; Pahl-Wostl et al., 2021), with policy enactment as the principal analytical lens and structured, focused comparison as the logic of cross-case comparison. This design was used to examine how global agendas on artificial intelligence in education are translated into national policy orientations, the distribution of authority among actors, regulatory-ethical framing, and implementation strategies across three education systems: Indonesia, Finland, and South Korea. The focus of the study was not on comparing levels of technological adoption, but on variations in the logic of policy enactment across education systems.

Documents were treated as qualitative data representing official articulations, normative arrangements, and implementation support mechanisms of policy. They were used to trace policy goals, authority structures, actor positioning, regulatory language, ethical frameworks, and implementation instruments shaping policy enactment. Cross-case comparison was conducted through the same set of analytical questions for each country, allowing each case to be read through equivalent dimensions. This approach made it possible to move beyond policy content towards the configuration, mediation, and operationalisation of policy in different national contexts (Bowen, 2009; Braun et al., 2010, 2011; George & Bennett, 2005).

Case Selection

The three cases were selected purposively using a maximum variation comparative design. All three countries respond to global agendas on artificial intelligence in education, yet they display sharply contrasting enactment configurations. Cross-case variation was necessary to clarify that policy differences lie not only in programme content or levels of readiness, but in the underlying logic of enactment. In this study, maximum variation was constructed primarily along three axes: the locus of enactment authority, the degree of regulatory-ethical institutionalisation, and the mode of policy implementation.

Indonesia was selected because it is in an early phase of institutionalising artificial intelligence policy in education through curriculum integration, teacher capacity building, and gradual implementation adjusted to the readiness of education providers. Finland was selected because it demonstrates strong policy institutionalisation through the governance of educational digitalisation, regulatory compliance, ethics, and artificial intelligence literacy. South Korea was selected because it exhibits state-led reform supported by infrastructure and implemented through operational national rollout. The selection of these three cases was intended to provide sufficient contrast in the ways global agendas are translated, directed, and operationalised within national education systems.

Case selection was not intended for statistical generalisation, but for analytical generalisation through comparison of theoretically contrasting enactment configurations. In this sense, the three countries function as analytically significant cases that make visible different ways in which similar global agendas are organised, authorised, and operationalised. This logic is consistent with comparative case study research, in which each case is treated as a unit of analysis examined through the same guiding questions. The methodological position therefore accords with the purpose of the study, which is comparative explanation rather than population estimation (Bray & Thomas, 1995; George & Bennett, 2005).

Data Sources and Research Corpus

The data consisted of official policy documents and supporting enactment documents directly related to artificial intelligence in school education. Core documents included regulations, national strategies,

implementation guidelines, ethical principles, and policy materials articulating the official direction of the state. Supporting documents included official ministry news items, implementation mobilisation materials, capacity-building documents, and analytical materials that helped clarify how policy was explained, advanced, and operationalised. This distinction allowed the analysis to capture policy both as a normative text and as a process driven through implementation instruments. Not all documents carried the same evidential weight. Core documents were used to examine policy orientation, the distribution of authority, and the formal design of enactment, whereas supporting documents were used to clarify processes of mobilisation, translation, and implementation support. This distinction prevented formal regulations from being treated as equivalent to explanatory implementation materials.

The study drew on 22 documents, comprising nine from Indonesia, seven from Finland, and six from South Korea (Badan Standar, Kurikulum, & Asesmen Pendidikan, 2025; Finnish National Agency for Education, 2025c, 2025d, 2025e, 2025f; Kementerian Pendidikan Dasar dan Menengah, 2025b, 2025c, 2025d, 2025e, 2025f, 2025g; Ministry of Education and Culture of Finland, 2023a; Ministry of Education of the Republic of Korea, 2022, 2023b, 2024a, 2024b, 2024c). Differences in the number of documents across cases were not treated as indicators of policy strength, but as consequences of different forms of policy articulation in each country. Comparability was established not through uniformity in the number of documents, but through equivalence in the analytical functions of the selected materials. The corpus included documents in three languages, namely English, Indonesian, and Korean. All documents were analysed either in their original language or in official English versions published by the relevant institutions. Where official English versions existed, those versions were used as the primary analytical reference to preserve institutionally authorised policy terminology. Where no official English version was available, the original document was read, and key policy segments were translated for analysis by the authors using a meaning-preserving procedure that prioritised legal and policy equivalence rather than literal translation. In such cases, translated segments were cross-checked against the original wording during coding and interpretation to reduce semantic drift. Accordingly, all direct quotations presented in this article are reported in English, while interpretation remained grounded in the original source texts to preserve policy meaning and terminological accuracy across cases.

Document Selection Criteria

Documents were selected according to five criteria. First, they had to be published by official or semi-official sources possessing policy authority, implementation authority, or institutionally accountable legitimacy. Second, they had to relate directly to artificial intelligence in school education or to educational digitalisation explicitly incorporating artificial intelligence as a policy element. Third, they had to contain at least one of the following elements: policy orientation, actor configuration, regulation, ethics, artificial intelligence literacy, or implementation strategy.

Fourth, the documents had to be directly relevant to the four research questions. Fifth, they had to fall within a policy development period relevant to the contemporary phase of institutionalising artificial intelligence in education in each country. These criteria maintained the focus of the corpus, clarified the basis for inclusion and exclusion, and reduced the entry of documents that were informative but insufficient for examining policy enactment. Conversely, documents consisting only of general promotional material, media commentary without institutional authority, or material lacking a direct connection to policy orientation, actor configuration, regulatory-ethical framing, or implementation were excluded from the corpus.

Research Data Corpus

The research corpus consisted of core documents and supporting documents selected for each country on the basis of source hierarchy, analytical function, and relevance to the focus of the study. The corpus was not constructed on the basis of identical numbers, but on evidential sufficiency in order to preserve analytical comparability across cases. The composition of the corpus in each country is presented in [Table 1](#).

Table 1. Research data corpus by country and document function

Country	Core documents	Strong supporting documents	Total
Indonesia	Academic Paper on Coding and Artificial Intelligence Learning; Ministerial Regulation of the Ministry of Primary and Secondary Education No. 13/2025; Ministerial Decree of the Ministry of Primary and Secondary Education No. 127/P/2025; Director General Decree of GTKPG No. 5/B/HK.03.01/2025; Circular Letter No. 10/2025	The Ministry of Primary and Secondary Education Prepares Coding and Artificial Intelligence Facilitators for Teachers; In the New Academic Year, 40,000 Early Childhood, Primary, and Secondary Education Units Implement Coding and Artificial Intelligence Learning; Technical Guidance on Coding and Artificial Intelligence: The Minister of Primary and Secondary Education Emphasises the Importance of Ethical Technology Mastery; Deputy Minister Opens Training of Trainers on Coding and Artificial Intelligence for Teachers, Emphasising Ethics and Digital Responsibility	9
Finland	Policies for the Digitalisation of Education and Training until 2027; Artificial Intelligence in Education: Legislation and Recommendations; Background Material: AI and Ethics in Education; Background Material: AI Literacy	Background Material: The Artificial Intelligence Act; Digitalisation vaikutukset oppimiseen, osaamiseen ja hyvinvointiin; Opetusalan toimijoiden näkökulmia digitalisaatioon	7
South Korea	Digital-driven Education Reform Plan Announced: Unlocking Opportunities for Personalized Learning in Education; AI Digital Textbooks for 2025 to Realize Personalized Education for All; Safe Use of AI in Education	Teachers, Students, and Parents to Directly Propose Ideas for Developing AI Digital Textbooks; Digital Era Innovation Shared on the Theme of Classroom Revolution Led by Teachers: A Grand Journey; Edtech Comes Together to Support Classroom Revolution Led by Teachers with AI	6
Total	12	10	22

Note. Core documents include policy documents, regulations, official guidelines, and strategic papers that directly establish or frame the orientation of artificial intelligence policy in education. Strong supporting documents include background materials, implementation documents, progress reports, and official institutional communications used to clarify context, implementation direction, and enactment dynamics.

Data Collection Procedure

Data collection was carried out in five stages. In the first stage, documents were identified through targeted searches of official and semi-official institutional sources in each country, including ministry websites, national education agency portals, official policy repositories, and institutionally authorised implementation pages. The search process combined document-title searches, targeted internal government site searches, and manual browsing of policy and news sections within these official institutional portals using English and national-language keywords equivalent to artificial intelligence, education, school, digitalisation, curriculum, ethics, regulation, literacy, textbook, guidance, teacher training, and implementation. In the second stage, all retrieved materials were screened according to the predefined inclusion and exclusion criteria. In the third stage, eligible documents were classified into the core corpus and the supporting corpus based on their analytical function and evidential weight.

The fourth stage involved close reading of all documents to assess the alignment of their contents with the analytical dimensions. The fifth stage involved transferring relevant information into a cross-national analytic extraction matrix. The extraction matrix-maintained consistency in the questions posed to each document and ensured that cross-case comparison was conducted along the same dimensions. At a minimum, each entry in

the matrix included the identity of the document, publication year, source institution, document status as core or supporting, relevant quotations or content segments, the related analytical dimension, and preliminary notes concerning indications of enactment. This procedure enabled direct comparison not only of policy content, but also of source authority, policy function, and enactment relevance across the three cases.

Unit of Analysis

The unit of analysis in this study was the enactment of artificial intelligence policy within national education systems. This unit was examined through four dimensions corresponding directly to the focus of the study: the translation of global agendas into national policy orientations; the configuration of the roles of the state, educational institutions, and teachers; regulation, ethics, and institutional safeguards; and implementation strategies shaping patterns of policy enactment. These four dimensions kept the comparison focused on the aspects most relevant to the purpose of the study. In comparative education research, clarity regarding the unit of comparison and the level of analysis is essential if comparison is to remain sufficiently focused while retaining explanatory power (Bray & Thomas, 1995). Each document was therefore read according to its contribution to these four dimensions. Comparative findings were then derived from the same dimensions rather than from general impressions of each country.

Data Analysis

The analysis was conducted through qualitative content analysis combined with document-based comparative thematic coding. In the first stage, each document was read repeatedly to extract information concerning policy goals, implementing actors, the position of teachers, regulatory foundations, ethics, artificial intelligence literacy, funding support, infrastructure, and implementation strategies. In the second stage, the extraction results were entered into a cross-national analytical matrix. In the third stage, initial coding was conducted deductively based on the four research questions and the four predefined analytical dimensions. At this stage, the coding units consisted of statements, provisions, institutional explanations, or policy segments containing substantive information on orientation, actors, regulation and ethics, or implementation.

In the fourth stage, coding was developed inductively to capture distinctive patterns, policy emphases, and enactment configurations that could not be fully anticipated in advance. In the fifth stage, cross-case categories were compared to identify recurring similarities, differences, and configurational tendencies. The use of deductive-inductive procedures kept the analysis aligned with the research questions while remaining open to patterns emerging from the data (Schreier, 2012; Bowen, 2009). Coding was directed not only at explicit statements in the documents, but also at actor positioning, the distribution of authority, ethical framing, and the relationship between policy and implementation instruments. In this way, the reading moved beyond the declarative content of documents towards an interpretation of the logic of enactment embedded within them. To ensure that inference did not exceed the evidence, interpretations concerning the distribution of authority and the logic of enactment were drawn only when supported repeatedly by combinations of relevant core and supporting documents.

Construction of the Analytical Typology

The final typology was constructed in four analytical steps. First, document-level codes were consolidated into cross-case categories relating to policy orientation, actor configuration, regulatory-ethical framing, and implementation strategy. Second, these categories were compared systematically across the three cases to identify the dimensions that most clearly differentiated one enactment configuration from another. Third, from this comparison, three higher-order analytical axes were derived: the locus of enactment control, the degree of regulatory-ethical institutionalisation, and the mode of policy implementation. These axes were therefore not imposed as a priori labels, but formulated as analytical abstractions from repeated cross-document and

cross-country comparison. Fourth, the dominant configuration of each case was interpreted through the interaction of these three axes, generating three enactment patterns: capacity-led enactment, regulatory-literacy enactment, and scaled rollout enactment.

The resulting typology is not a descriptive summary of the three countries, but an analytical framework developed from the patterned interaction between authority, regulatory-ethical institutionalisation, and implementation mode. Each type is treated as an ideal-typical pattern derived from dominant tendencies in the data rather than as a rigid category that eliminates possible overlap. This means that some features may appear across more than one case, but each case was assigned to the type most consistently supported by the overall evidential pattern. Such an approach is consistent with comparative qualitative analysis, which requires a transparent connection between data, categories, and conceptual abstraction (Schreier, 2012).

Trustworthiness and Analytical Traceability

The trustworthiness of the analysis was maintained through four strategies. First, evidential cross-checking across documents was undertaken through comparison among regulations, guidelines, strategies, ethical principles, and supporting implementation documents within each country. Second, an analytical audit trail was maintained through the use of extraction matrices, coding frames, categorisation notes, and explicit differentiation between core and supporting documents. Third, cross-case consistency was ensured using the same analytical dimensions, the same guiding questions, and the same comparative matrix for each country. Fourth, interpretive restraint was maintained by limiting claims to what could be repeatedly supported across documents and by clarifying that the findings concern policy enactment as represented in policy and implementation documents rather than direct observations of practice at school level.

Because this was a document-based qualitative analysis rather than a positivist coding exercise, trustworthiness was not pursued through statistical intercoder agreement. Instead, reliability was strengthened through procedural transparency, repeated return to the source documents, category refinement through audit notes, and cross-document verification of interpretive claims. In this study, analytical credibility therefore rests on the clarity of the selection logic, the traceability of the analytical steps, the comparability of evidential functions across cases, and the consistency of the relationship between categories and evidence (Bowen, 2009).

FINDINGS

Artificial intelligence policy in education in Indonesia, Finland, and South Korea reveals consistent cross-national differences in policy orientation, the distribution of enactment authority, regulatory-ethical institutionalisation, and implementation strategy. These differences do not primarily lie in whether artificial intelligence is present in education, but in how policy is framed, authorised, mediated, and operationalised within each education system. Across the three cases, the empirical pattern is best understood through three differentiating axes: the locus of enactment authority, the degree of regulatory-ethical institutionalisation, and the mode of policy implementation. The findings below are therefore organised not as country summaries alone, but as a comparative interpretation of how these axes combine to produce different logics of policy enactment. The comparative matrix shows that differences across the three countries are produced through the interaction of policy orientation, authority structure, regulatory-ethical institutionalisation, and implementation mode. Indonesia demonstrates an enactment logic grounded in gradual capacity building and differentiated readiness across education providers. Finland demonstrates enactment strongly mediated by education providers within a layered regulatory-ethical and literacy-based framework. South Korea demonstrates state-led reform enacted through operational targets, infrastructure support, and large-scale rollout. **Table 2** presents the comparative matrix of artificial intelligence policy enactment across Indonesia, Finland, and South Korea.

Table 2. Comparative matrix of artificial intelligence policy enactment in education

Dimension of findings	Indonesia	Finland	South Korea
Policy orientation	Gradual digital transformation of education based on the readiness of education providers	Equitable, sustainable, secure, and system-governed educational digitalisation	Artificial intelligence-based learning reform for personalised learning
Position of artificial intelligence in policy	Elective subject of Coding and Artificial Intelligence, together with the strengthening of computational thinking	Part of a broader policy package on digitalisation, legislation, ethics, and AI literacy	Principal instrument of classroom transformation through AI digital textbooks
Principal steering actor	State/central government	Education providers within the framework of national guidance	State through the Ministry of Education and provincial education offices
Position of educational institutions	Policy implementers according to resource readiness	Principal mediators of enactment through local guidance and organisational management	Implementers of reform within a state-directed system
Position of teachers	Principal implementers strengthened through training, facilitators, and learning communities	Professionals expected to use, evaluate, and explain the use of artificial intelligence critically and ethically	Professional actors mobilised within artificial intelligence-based classroom reform
Regulation and ethics	Normative-operational through regulation, implementation guidance, training, and risk management	Highly structured through the AI Act, GDPR, ethics, AI literacy, and curriculum alignment	Ethics emphasised through the national principle of “AI that supports human growth”
Implementation strategy	Capacity building, in-on-in technical training, facilitators, model schools, BOS/BOP funding, gradual implementation	Guidance-based integration, AI literacy, local instructions, institutional mediation	National rollout, approved AI digital textbooks, leading teachers, digital tutors, infrastructure support
Form of enactment	Capacity-led and gradually decentralised	Regulatory-guided and locally mediated	State-steered and rollout-driven

Translation of Global Agendas into National Policy Orientations

Global agendas on artificial intelligence are translated differently across the three education systems. Indonesia places them within a framework of digital transformation that is gradual, adaptive, and dependent on the readiness of education providers. Finland incorporates them into the governance of educational digitalisation, emphasising equity, sustainability, security, accessibility, and competence. South Korea directs them more explicitly towards personalised learning, classroom transformation, and the differentiation of students' learning processes.

In Indonesia, artificial intelligence does not appear as a wholly separate policy domain, but is incorporated into curriculum expansion, the strengthening of computational thinking, and digital literacy. This orientation is

made explicit in the implementation guideline, which states that “as an elective subject, it does not require all education units to provide the subject matter” (Kementerian Pendidikan Dasar dan Menengah, 2025a). Rather than mandating immediate universal provision, the Indonesian policy corpus opens space for flexible adoption across different types of schools and levels of readiness. This indicates that global agendas are translated into a readiness-sensitive policy orientation in which enactment begins through state-supported opening rather than compulsory system-wide rollout.

In Finland, artificial intelligence is positioned within a broader architecture of educational digitalisation policy. The documents reveal close interconnections among the use of artificial intelligence, legislation, ethics, literacy, institutional responsibility, and system management. The official guidance states that the material is intended to support education providers and to promote the “responsible, safe and innovative use of AI” (Finnish National Agency for Education, 2025a). This means that global agendas are translated not into a technology-first orientation, but into a governance-first orientation centred on legality, competence, and institutional order.

In South Korea, artificial intelligence appears more directly as an instrument of learning reform. The reform plan explicitly states that “this plan envisions ‘personalized learning’ enabled by leading technologies such as Artificial Intelligence (AI)” (Ministry of Education of the Republic of Korea, 2023a). Compared with Indonesia and Finland, artificial intelligence is therefore positioned more clearly as an operational reform instrument closely tied to classroom transformation and differentiated learning support.

Comparatively, the translation of global agendas yields three distinct policy orientations: readiness-based gradual transformation in Indonesia, governance-based digitalisation in Finland, and personalised learning reform in South Korea. These differences shape the subsequent configuration of authority, regulation, and implementation across the three cases.

Configuration of the Roles of the State, Educational Institutions, and Teachers

The distribution of actor roles reveals marked differences across the three systems. The difference lies not only in who is involved, but in who holds the principal authority to translate policy into actionable practice. The state, educational institutions, and teachers are present in all three cases, but they do not occupy equivalent positions.

In Indonesia, the state occupies the principal steering role. The technical guideline explicitly recognises uneven institutional conditions, stating that “teacher preparation needs to be carried out gradually” (Direktorat Jenderal Guru, Tenaga Kependidikan, dan Pendidikan Guru, 2025). This is consistent with a governance arrangement in which the centre sets direction, organises training, prepares facilitators, develops teaching resources, regulates support mechanisms, and structures implementation pathways across administrative levels. Teachers are positioned as the main classroom implementers, but their enactment role is substantially shaped by state-designed support structures, while educational institutions operate within differentiated conditions of readiness.

In Finland, the central enactment role lies with education providers. The recommendations state that “education providers are tasked with outlining the use of AI in their own organisations’ operations” and with “assessing the need for staff training and guidance” (Finnish National Agency for Education, 2025a). This directly indicates that enactment is mediated institutionally rather than scripted through a uniform central rollout. Teachers appear not merely as implementers, but as professionals expected to evaluate, justify, and explain the educational use of artificial intelligence critically and ethically.

In South Korea, the state also retains strong control, but implementation is organised through broad system mobilisation. The reform plan states that “AI-driven digital textbooks will be phased-in for math, English, and informatics from 2025” and that “the Ministry of Education will coordinate with local offices of education and ensure that every school has wireless net and digital devices” (Ministry of Education of the Republic of Korea, 2023a). Provincial education offices, schools, developers, teachers, students, and parents are drawn into implementation and refinement, but within a reform architecture orchestrated from above.

Comparatively, the distribution of actor roles reveals three distinct authority configurations: state initiation in Indonesia, institutional mediation in Finland, and state-directed mobilisation in South Korea. The key difference lies in which actor or institutional level is authorised to convert policy into practical direction.

Regulation, Ethics, and Institutional Safeguards

Regulation, ethics, and institutional safeguards are present in all three cases, but with differing levels of intensity and depth. In Indonesia, policy safeguards are built through a combination of curriculum regulation, implementation guidance, strengthened training, directed funding, and ethical framing within implementation documents. The technical guideline makes this explicit by stating that teachers are expected to use artificial intelligence “responsibly” and in accordance with “human-centred principles and existing ethical standards” (Direktorat Jenderal Guru, Tenaga Kependidikan, dan Pendidikan Guru, 2025). However, these safeguards do not appear as a highly layered regulatory regime standing independently from implementation. Rather, they are embedded in the design of policy management, teacher preparation, and implementation support.

In Finland, safeguards appear in the most systemic and layered form. The ethical background material states that “the purpose of ethical principles for artificial intelligence in education is to support the realisation of the conditions for human-centred and good learning in the use of AI” (Finnish National Agency for Education, 2025b). The same material further identifies “transparency and accountability,” “privacy,” “security and safety,” “inclusiveness,” and “human-centred AI” as core principles (Finnish National Agency for Education, 2025b). This means that regulation in Finland is institutionalised not only as legal compliance, but also as an ethical, pedagogical, and competence-based condition of educational use.

In South Korea, safeguards are articulated primarily through a protective framework accompanying policy expansion. The reform plan states that, in response to parental concerns, “a plan will be devised to create a safer classroom setting; harmful websites and apps will be blocked” (Ministry of Education of the Republic of Korea, 2023a). Within the corpus analysed, ethics functions less as a dense regulatory layering of the Finnish type and more as a normative boundary accompanying large-scale reform.

Comparatively, this dimension differentiates the cases not by the mere presence of ethics, but by the degree and mode of institutionalisation. Finland demonstrates highly structured regulatory-ethical institutionalisation; South Korea demonstrates ethics accompanying expansionary reform; and Indonesia demonstrates safeguards embedded in implementation design and policy management. These differences become visible through the way regulation and ethics are operationalised institutionally.

Implementation Strategies and Forms of Policy Enactment

The clearest differences across the three countries emerge in implementation strategy. This dimension provides the strongest empirical basis for distinguishing the resulting forms of enactment, because it shows how policy orientation and authority structure are converted into concrete operational pathways.

In Indonesia, implementation is built primarily through capacity strengthening. This logic is reflected both in the recognition that teacher preparation must proceed gradually under uneven school conditions and in the use of school model development as “proof of concept” for coding and artificial intelligence learning (Direktorat Jenderal Guru, Tenaga Kependidikan, dan Pendidikan Guru, 2025; Kementerian Pendidikan Dasar

dan Menengah, 2025a). The most prominent instruments include staged training, facilitators, model schools, learning communities, and specifically directed funding support. Policy also opens multiple pathways for enactment through elective subjects, cross-subject integration, co-curricular and extracurricular activities, and varied learning modes. These features indicate an implementation strategy that is flexible, gradual, and explicitly responsive to differences in institutional readiness.

In Finland, implementation proceeds through guidance-based and institutionally mediated integration rather than through a single national rollout pathway. The recommendations place responsibility on education providers for outlining organisational use, assessing staff training needs, and ensuring the legal and pedagogical conditions for deployment (Finnish National Agency for Education, 2025a). Because the Finnish education system is decentralised, enactment develops in locally varied ways while remaining within a coherent national framework. This pattern indicates that implementation is not driven by scale-first expansion, but by governance capacity, institutional interpretation, and professional mediation.

In South Korea, implementation appears as a large-scale national rollout. The reform plan states that “AI-driven digital textbooks will be phased in starting from 2025” and details multi-year scheduling, lead teacher preparation, lead schools, and infrastructure readiness (Ministry of Education of the Republic of Korea, 2023a). The same document also notes that over 300 lead schools for digital learning would be operated and that infrastructure would be secured before textbook implementation (Ministry of Education of the Republic of Korea, 2023a). This is the most operationally specified and nationally supported implementation strategy in the corpus.

Comparatively, implementation strategy differentiates the cases with clarity: Indonesia demonstrates gradual capacity-building, Finland demonstrates regulatory-guided and locally mediated integration, and South Korea demonstrates infrastructure-supported state rollout. The three cases differ not only in pace, but in the mechanism through which policy is made actionable.

Indonesia’s Position Within the Comparative Landscape of AI Policy Enactment

Indonesia occupies a distinctive position between Finland and South Korea. This position should not be read as an incomplete or lagging version of either model. Rather, Indonesia demonstrates its own enactment configuration shaped by policy priorities, the distribution of authority, and differing conditions of system capacity.

Compared with Finland, Indonesia places greater emphasis on the role of the state in driving early implementation through regulation, guidance, training, facilitators, and funding. However, Indonesia does not yet display the layers of regulatory compliance, literacy, and institutional safeguards that are as structured as those found in Finland. Compared with South Korea, Indonesia appears more gradual, more flexible, and more dependent on the readiness of education providers. Enactment in Indonesia has not moved towards a large-scale national rollout supported by infrastructure, but instead proceeds through teacher capacity building, the preparation of facilitators, model schools, and gradual expansion.

Even so, the Indonesian pattern remains consistent across three principal elements: emphasis on teacher capacity, gradual implementation, and the ethical framing of technology use. These recurring features appear across regulations, implementation guidance, and policy support instruments, which together indicate that Indonesia’s enactment logic is not merely transitional in a temporal sense, but structurally capacity-led. **Table 3** shows that the enactment pattern in each country is supported by recurring and consistent indicators across the document corpus.

Table 3. Evidence indicators supporting the enactment patterns

Country	Dominant indicators	Enactment pattern
Indonesia	Elective subject, gradual implementation, facilitators, staged training, directed funding, model schools, ethics of technology use	Capacity-led and gradually decentralised
Finland	Responsibility of education providers, local guidance, AI literacy, regulatory compliance, transparency, accountability, curriculum alignment	Regulatory-guided and locally mediated
South Korea	Personalised learning, AI digital textbooks, leading teachers, digital tutors, infrastructure support, system mobilisation, national ethical principle	State-steered and rollout-driven

The categorisation therefore does not rest on a single policy feature or isolated document, but on stable tendencies across policy orientation, authority structure, regulatory-ethical institutionalisation, and implementation mode. These recurring indicators support the construction of the three-part typology.

DISCUSSION

Differences in artificial intelligence policy in education across Indonesia, Finland, and South Korea are more appropriately explained through variations in the logic of AI policy enactment than through levels of technological adoption. The findings show that the principal distinction across cases lies not in the presence of technology itself, but in the ways global agendas are translated into national policy orientations, embedded in structures of authority, and enacted through different combinations of regulation, ethics, and implementation modalities. In line with Ball et al. (2012) and Braun et al. (2010, 2011), this study treats policy not as a fixed text that moves directly into practice, but as a process of interpretation, translation, and mediation shaped by institutional choices, system capacity, and operational instruments. These findings reinforce the argument in comparative and international education that global agendas do not travel into national contexts through linear adoption. As Cowen (2009) and Crossley and Watson (2009) suggest, what moves across contexts is not policy in complete form, but ideas that are selectively interpreted and reorganised within national settings. Indonesia translates global AI agendas into gradual digital transformation calibrated to provider readiness; Finland incorporates them into a governance framework of educational digitalisation grounded in legality, ethics, and competence; and South Korea directs them towards learning reform centred on personalisation and the transformation of classroom instruments. These differences indicate that global agendas acquire distinct national policy orientations once filtered through different institutional priorities and system capacities (Ball et al., 2012; Cowen, 2009; Crossley & Watson, 2009).

Cross-national variation in AI policy enactment is most clearly differentiated by the configuration of enactment authority. Indonesia relies primarily on state initiation, Finland on mediation by education providers, and South Korea on state direction supported by broad system mobilisation. As Ball et al. (2012) and Skerritt et al. (2023) emphasise, policy is always worked through differentiated actors occupying different positions in relation to policy. In the present study, when the state holds dominant control, enactment tends to proceed through regulation, capacity building, and administrative support structures. When educational institutions occupy the central mediating role, enactment depends more heavily on organisational capacity to formulate local rules, govern risk, and shape professional use. When the state leads through operational targets, approved platforms, and infrastructural support, enactment is more likely to move towards large-scale rollout. Policy content alone is therefore insufficient to explain enactment without attention to who is authorised to interpret, translate, and operationalise policy, and with what institutional support (Braun et al., 2010, 2011). In artificial intelligence policy for education, the distribution of authority is therefore not merely a contextual backdrop, but a principal axis shaping the overall logic of enactment. The analytical question shifts accordingly from “what does the

policy contain?” to “who is authorised to translate it, under what arrangements, and through which institutional supports and constraints?” McKay (2018), in analysing school improvement policy enactment, shows that local conditions shape enactment outcomes. The present findings indicate that AI policy enactment is structured by the way authority is distributed across the state, educational institutions, and teachers.

The findings indicate that regulation, ethics, and implementation modalities are inseparable in explaining forms of AI policy enactment. All three cases include ethical language, yet the degree and mode of institutionalisation differ. Finland demonstrates safeguards embedded in regulatory compliance, institutional responsibility, and AI literacy; South Korea positions ethics as an operational boundary for large-scale reform; and Indonesia attaches safeguards to implementation design through training, risk management, and digital responsibility. The key difference therefore lies not in the simple presence or absence of ethical norms, but in the extent to which those norms are translated into guidance, organisational responsibilities, professional competence, and implementation modalities that can actually be enacted (Alfiras et al., 2026; Funa & Gabay, 2025; Holmes et al., 2022; Nguyen et al., 2023). This interpretation is consistent with Cooney et al. (2023), who show that enactment depends on how policy is embedded in planning processes, local interpretation, and accountable routines. Implementation modalities emerge, in turn, as the operational mechanism through which policy orientation becomes visible in enactment. Indonesia builds its implementation base through training, facilitators, model schools, learning communities, and directed funding. Finland proceeds through guidance, local instructions, organisational mediation, and the strengthening of AI literacy. South Korea advances enactment through digital textbooks, leading teachers, digital tutors, infrastructure investment, and scheduled national rollout. Lambert et al. (2021) show that artefacts and supporting materials contribute to how policy is represented and stabilised in practice; in the three cases examined here, implementation modalities perform that same operational role.

From these recurring patterns, the study formulates three types of artificial intelligence policy enactment in education. Capacity-led enactment refers to a pattern in which the state builds the implementation base through capacity strengthening, gradual expansion, and adaptation to inequalities in institutional readiness. Regulatory-literacy enactment refers to a pattern in which the use of technology is governed through institutional responsibility, regulatory compliance, ethical framing, and explicitly articulated professional competence. Scaled rollout enactment refers to a pattern in which reform is pursued through broad implementation targets, infrastructural support, approved platforms or tools, and scheduled mobilisation of the education system. These types identify the analytical pattern emerging from the comparison: each case is organised through a different relationship among enactment authority, regulatory-ethical institutionalisation, and implementation modalities.

This typology constitutes the study’s principal analytical contribution because it does not simply label three countries; it provides a framework for interpreting cross-national policy variation through the interaction of three axes. The three cases represent distinct logics of AI policy enactment shaped by particular configurations of authority, regulation, ethics, and implementation modalities. Indonesia’s position is especially instructive in this regard. Indonesia does not demonstrate regulatory institutionalisation and literacy structures as extensive as those of Finland, yet it has also not moved towards national rollout on the scale seen in South Korea. Its analytical significance lies in showing how AI policy enactment can proceed through a capacity-led configuration under conditions of uneven institutional readiness. Policy direction has been formulated, teacher capacity is being built, funding has been directed, and ethical framing has been attached to implementation, yet enactment still relies on gradual capacity strengthening rather than either dense regulatory layering or immediate rollout. This configuration indicates that uneven institutional readiness shapes the form of enactment and supports interpretation of Indonesia as a distinct capacity-led case rather than an incomplete one.

More broadly, artificial intelligence policy in education cannot be read adequately as a technical innovation or a modernisation agenda alone. It is more appropriately understood as a governance choice that determines how global agendas are translated into national policy orientations, how the roles of the state, educational institutions, and teachers are configured, how regulation and ethics are institutionalised, and which implementation modalities make policy actionable. What distinguishes the three systems is therefore the arrangement of authority, institutional safeguards, and implementation modalities through which policy is enacted.

CONCLUSION

Artificial intelligence policy in education in Indonesia, Finland, and South Korea does not develop through a uniform trajectory, even though all three respond to broadly similar global agendas. The principal difference lies not in whether artificial intelligence is present in education, but in how global agendas are translated into national policy orientations, how enactment authority is distributed, how regulatory and ethical safeguards are institutionalised, and through which implementation modes policy is advanced. Indonesia demonstrates a capacity-led pattern grounded in gradual implementation and the strengthening of teacher and institutional readiness. Finland demonstrates a regulatory-literacy pattern in which enactment is mediated by education providers and structured through legality, ethics, and professional competence. South Korea demonstrates a scaled rollout pattern driven by strong state direction, infrastructure support, and operational reform for personalised learning. These findings show that cross-national differences in artificial intelligence policy in education are better explained through variations in enactment structure than through technology adoption alone. In comparative and international education, what ultimately distinguishes the three systems is therefore not the technology itself, but the arrangement of authority, institutional safeguards, and implementation instruments through which policy is made operational.

IMPLICATIONS

The findings of this study carry important implications for both policy and scholarship. For policymakers, the study shows that artificial intelligence policy in education cannot be reduced to normative ambition, technological provision, or innovation rhetoric alone. Policy becomes consequential only when it is supported by a clear implementation architecture, a workable distribution of authority, adequate professional support, and institutional safeguards capable of regulating educational use responsibly. This means that effective artificial intelligence policy requires more than endorsement; it requires enactment conditions. Policies that overlook readiness, organisational mediation, or ethical-regulatory institutionalisation risk remaining symbolic rather than operational. For comparative education scholarship, the study offers a more precise analytical framework for interpreting variation across education systems. The typology of capacity-led enactment, regulatory-literacy enactment, and scaled rollout enactment advances comparative policy analysis by showing that cross-national variation is more meaningfully understood as a difference in governance configuration than as a difference in technological advancement. More specifically, the typology provides a practical set of analytical questions for future comparative work: who holds enactment authority, how regulatory and ethical safeguards are institutionalised, and which implementation modalities carry policy into practice. The study therefore contributes to policy enactment scholarship by positioning authority, regulatory-ethical institutionalisation, and implementation mode as central explanatory axes in the analysis of artificial intelligence policy in education.

LIMITATIONS

This study is subject to several limitations that define the scope of its claims. First, the analysis is based on official policy documents and supporting enactment documents, and therefore captures how policy is framed, authorised, and legitimised at national and institutional levels rather than how it is interpreted and negotiated in everyday educational practice. As a result, the study does not directly observe enactment in schools, classrooms, or local administrative settings. Second, the inclusion of three education systems means that the study aims for analytical rather than statistical generalisation. The typology proposed here should therefore be read as an analytically transferable framework, not as a universally exhaustive classification of all possible national approaches. Third, the field of artificial intelligence in education is developing rapidly, and policy architectures may shift as regulations, institutional priorities, and implementation infrastructures evolve. The findings should therefore be interpreted as capturing a particular phase of policy development rather than a fixed and enduring settlement. These limitations do not reduce the value of the study, but they do require that its contribution be read as a theoretically informed comparative explanation of policy enactment at a specific moment of institutional development.

FUTURE RESEARCH

Several directions for future research follow from this study. First, document-based comparative analysis should be extended through school-level and classroom-level studies examining how national policy is interpreted, negotiated, resisted, or adapted by school leaders, teachers, and local authorities. Such work would clarify how formal policy architectures are translated into lived enactment. Second, future comparative studies should test the analytical transferability of the proposed typology across additional national and subnational contexts, particularly in education systems that combine decentralised governance with emerging artificial intelligence agendas. Such studies could operationalise the typology by examining three dimensions comparatively: the configuration of enactment authority, the degree of regulatory-ethical institutionalisation, and the implementation modalities through which policy is made actionable. Third, longitudinal research is needed to examine whether enactment patterns remain stable or shift over time as regulatory frameworks mature, institutional capacities develop, and implementation infrastructures expand. Taken together, these directions would deepen understanding not only of whether artificial intelligence policy exists, but of how it acquires practical force across different educational settings.

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