



RESEARCH

Teacher Digital Literacy Gaps in Indonesian Education Policy Discourse: A Thematic Analysis of Practitioner and Regulator Perspectives

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Abstract

Teacher digital competence is a key determinant of digital transformation in education. Yet digital literacy gaps among Indonesian teachers persist, even as the government distributes digital infrastructure nationwide. Prior research has largely measured this competence through self-report surveys, capturing its determinants more than the surrounding discourse. This study extends that work by examining how education practitioners and regulators debate the gap within the same forum, and by linking it to literacy in open educational resources and open-source software. It aims to identify the forms of teacher digital literacy gaps and the relational patterns between practitioner and regulator perspectives in Indonesian education policy discourse in 2025. The study used a qualitative design with Braun and Clarke six-phase thematic analysis of an education policy talk show featuring an education practitioner and a Ministry of Primary and Secondary Education official. The analysis produced four themes: digital literacy competence gaps as a fundamental problem, technology treated as an administrative tool rather than a vehicle for pedagogical transformation, the risk of teachers falling behind students digital familiarity, and policy responses emphasizing infrastructure distribution. These findings reveal a consistent emphasis gap between competence-oriented and infrastructure-oriented solutions. The study's originality lies in bringing practitioner and regulator voices together within a single discourse event rather than as separate survey populations, while its novelty rests on linking this discourse to a previously unexamined dimension: teacher literacy in open educational resources and open-source software. It offers an empirically grounded, discourse-based alternative to the prevailing survey-based literature on teacher digital competence.

Keywords digital divide; teacher digital literacy; thematic analysis; digital education policy; open educational resources

INTRODUCTION

Digital transformation has reshaped how education is delivered across most of the world. Teacher digital competence is widely recognized as a key determinant of this transformation's success. Cross-national studies using PIAAC/TALIS data show that teachers' technology attitudes and knowledge strongly predict teaching quality (Hämäläinen et al., 2021). Studies in Poland and Spain confirm that digital competence correlates with the integration of Technological Pedagogical and Content Knowledge (TPACK) and with institutional support factors (Bueno-Baquero et al., 2026; Jorge-Vázquez et al., 2021). All three studies, however, rely on large-scale self-report surveys. Such surveys demonstrate association patterns clearly but explain poorly how this competence is debated in the actual discourse of teachers and policymakers.

In Indonesia, this urgency connects directly to a projected need for nine million digital talents between 2015 and 2030. The government responded through Presidential Instruction Number 7 of 2025, which initially targeted digitalization assistance for approximately 330 thousand educational institutions. This target was later formalized for 288 thousand schools in November 2025, roughly 87 percent of the original scope. This policy document, however, structurally favors a device-provision logic and lacks explicit indicators for improving teacher competence. Cross-national meta-analytic evidence confirms that access to technology alone yields only modest achievement gains, with impact depending far more on how technology is used pedagogically than on access itself (de Luis García, 2024; Li et al., 2026). This pattern is consistent with the 2024 Indonesia Digital Society Index (Indeks Masyarakat Digital Indonesia, IMDI). The index recorded an infrastructure and ecosystem score of 52.70, compared with an empowerment score of only 25.66, a gap of 27.04 points on a 100-point scale (Koswara, 2024). Notably, the infrastructure score declined by 4.39 points from 57.09 in 2023, whereas the empowerment score fell by only 0.53 points over the same period. This asymmetry suggests that the competence-infrastructure gap persists regardless of short-term fluctuations in infrastructure provision. This pattern also aligns with a review of Indonesia's underdeveloped, frontier, and outermost regions (known locally as daerah 3T). That review found that human-resource limitations dominate over equipment limitations (Akbar & Wijaya, 2024).

At the teacher level, Indonesian studies converge on identifying the digital literacy gap as a systemic constraint (Endrawati Subroto et al., n.d.; Halim & Hidayat, 2025; Imaduddin & Firdaus, 2025; Putri Lestari & Hasjiandito, 2025). These studies remain polarized, however, between macro-level literature reviews without new primary data and micro-level case studies of one or two schools. Several other studies measure digital literacy from the student side, using it as an indirect proxy for teacher readiness. This approach is problematic because student achievement is shaped by many factors beyond teacher competence. The problem deepens further with evidence that owning devices does not automatically change teaching practice. Teachers' self-efficacy toward technology remains low even when access is available (Abedi et al., 2024; Clipa et al., 2023), and meaningful TPACK integration requires sustained, structured training rather than mere exposure to technology (Disonglo & Limpot, 2023; Zhang et al., 2026).

One relevant yet rarely examined dimension is teacher literacy in open educational resources and open-source software. A meta-analysis of 25 studies ($N = 119,840$) found a positive but small effect of Open Educational Resources (OER) on learning outcomes ($g = 0.07$; $p < 0.001$). This result suggests that OER benefits depend more on the quality of 5R framework implementation (retain, reuse, revise, remix, and redistribute) than on license availability alone (Kuo et al., 2024; Tlili et al., 2023). This finding aligns with evidence that the intention to use or create OER depends heavily on understanding legal-licensing frameworks rather than technical aspects alone (Adedoyin & Altinay, 2023; Chiappe et al., n.d.; Thinh, 2026). Regarding software, awareness of Free and Open Source Software (FOSS) among educators remains low (Nayak & Binjha, 2022; Silva et al., 2023). That study, however, was conducted in Indian higher education, not among Indonesian primary and secondary teachers. The literature search for this study found no prior work that integrates OER literacy, FOSS/copyleft literacy, and copyright exceptions under Article 44 of Law No. 28/2014 (Nurlaily et al., 2025) into one coherent framework of teacher digital literacy.

Weak teacher digital literacy has downstream effects on student digital citizenship, including heightened risk of academic misconduct such as plagiarism (Mulenga & Shilongo, 2024). Conceptual studies emphasize the need for new instructional strategies to counter disinformation. An experimental intervention in Indonesia demonstrates causally that online media literacy reduces students' intent to spread misinformation (Ford et al., 2023), and a large-scale European survey confirms a similar pattern (Bulya & Izzati, 2024; Vissenberg et al., 2023). However, teachers themselves often struggle to evaluate digital sources critically before they can model this skill for students (Bruno et al., 2025). No study, however, has yet examined this teacher-student trajectory from the perspective of teacher discourse itself.

Three research gaps can be summarized. First, the digital competence literature is dominated by self-report surveys that measure determinants but fail to capture the discourse behind them. Second, Indonesian studies have not yet brought practitioner and regulator perspectives together within a single qualitative unit of analysis, even though the two sides emphasize solutions pointing in different directions, competence versus infrastructure. Analyzing both perspectives within a single unit of analysis, rather than through separately collected data, matters methodologically because it allows points of friction and misalignment between practitioner and regulator framings to be observed directly as they occur in the same exchange, rather than reconstructed after the fact from two unconnected datasets. Third, OER/FOSS/copyleft literacy has been studied separately from teacher digital-divide discourse and has not been tested in the context of Indonesian primary and secondary teachers. This study addresses all three gaps through a qualitative thematic analysis of an education policy talk show discourse that directly brings practitioners and regulators together (Clark, 2024). The coding framework covers three dimensions: technical-pedagogical (TPACK), legal-openness (OER/5R, FOSS/copyleft, copyright exceptions), and ethical-citizenship (plagiarism, disinformation), which converge on a dichotomy between competence-oriented and infrastructure-oriented policy responses.

Given these gaps, the central research problem this study addresses is how the teacher digital literacy gap is articulated and negotiated within direct practitioner-regulator discourse, and how the two perspectives relate to one another in proposing solutions to that gap. Building on this rationale, this study pursues three objectives: (1) to identify the forms of teacher digital literacy gaps as represented in Indonesian public education discourse in 2025; (2) to analyze the relational patterns between practitioner and regulator perspectives on solutions to this gap, through cross-informant thematic analysis within a single discussion session; and (3) to formulate policy implications for strengthening teacher digital literacy that can realistically be pursued within the coming year, in line with the implementation period of Presidential Instruction No. 7/2025.

To pursue these objectives, this study employs a qualitative design using Braun and Clarke's (2006) six-phase thematic analysis, applied to a single education policy talk show that brought together an education practitioner and a Ministry of Primary and Secondary Education official as its unit of analysis. This approach allows the gap to be examined as it is directly articulated and negotiated between the two parties, rather than inferred from separate self-report measures. The following section details the research design, data collection, analysis procedure, and data validation strategy employed.

CONCEPTUAL FRAMEWORK

This study organizes the teacher digital literacy gap around three interrelated dimensions. The first, technical-pedagogical, draws on TPACK to capture how teachers integrate technology into instructional practice. The second, legal-openness, covers OER and the 5R framework, together with FOSS, copyleft licensing, and the copyright exceptions under Article 44 of Law No. 28/2014. The third, ethical-citizenship, addresses downstream risks such as plagiarism and disinformation when digital competence fails to transfer from teacher to student.

These three dimensions do not operate independently. Instead, they converge on a single underlying tension: whether policy solutions emphasize teacher competence or infrastructure supply. Practitioners may frame the gap primarily through the technical-pedagogical and ethical-citizenship dimensions, foregrounding mindset change and instructional transformation. Regulators, by contrast, may frame the same gap primarily through infrastructure distribution, leaving the legal-openness dimension largely unaddressed in both framings.

Building on this framework, the discourse under study may extend beyond a simple binary between access and skill, consistent with second-level digital-divide theory. It may instead indicate a further shift toward outcomes and benefits realized through technology use, a pattern associated with a third-level digital divide. This conceptual framework therefore guides both the deductive coding structure applied during analysis and the interpretive lens used to relate practitioner and regulator perspectives to one another.

RESEARCH METHODS

Research Design

This study employs a qualitative design using thematic analysis, following the six-phase framework of Braun and Clarke (2006). Three considerations guided this design choice. First, the study aims to understand the meanings and patterns that emerge in teacher digital-divide discourse as directly articulated by education practitioners and policymakers. Second, the data consist of public discourse text, making thematic analysis more suitable than a quantitative approach. Third, as outlined in the literature review, most prior studies on teacher digital competence rely on large-scale self-report surveys; these surveys measure determinants well but explain the underlying process and discourse poorly. The qualitative design was therefore chosen to complement, not replace, that tradition.

Research Site

The unit of analysis is an education talk show titled "Indonesian Education Toward a Golden Indonesia or an Anxious Indonesia?", held at the Ministry of Primary and Secondary Education on 15 May 2025. This event contains verbatim statements from two key informants. The unit of analysis was selected using purposive, criterion-based sampling, with the following inclusion criteria: (1) the text is official coverage of a public discussion forum organized by a state institution, not an individual opinion on social media; (2) the text contains verbatim statements from at least two stakeholders in different roles, enabling cross-perspective relational analysis; (3) the topic directly relates to the teacher digital literacy gap; and (4) the text was published in 2025, consistent with the implementation period of the national education digitalization policy discussed in the introduction. Exclusion criteria include opinion texts without verbatim source quotations, duplicate texts covering the same forum from other media outlets, and texts whose authenticity cannot be verified.

Although the unit of analysis consists of a single event, this study treats it as a representative discursive episode rather than a claim to exhaustive coverage of national policy discourse. The talk show was organized directly by the Ministry of Primary and Secondary Education and brought together an official regulator alongside a recognized education practitioner in real-time exchange, a configuration rarely available in isolated policy documents or survey data. On this basis, the event is positioned as a bounded but analytically rich site where competence-oriented and infrastructure-oriented positions are articulated in direct proximity to one another, rather than as a representative sample of Indonesian education policy discourse as a whole.

Data Collection

Data collection followed a sequential procedure covering source acquisition, authenticity verification, familiarization, and instrument development, summarized in Table 1.

Table 1. Data collection procedure

Step	Procedure	Description
1	Data source acquisition	The coverage text was obtained from official transcription documents of the talk show event.
2	Authenticity verification	Authenticity was confirmed by checking that the informants' names, the date, and the event location were consistent and traceable.
3	Data familiarization	The text was read repeatedly and thoroughly, at least three times, while recording initial impressions as analytic memos without formal coding.
4	Instrument development	A codebook was developed hybridly, combining a priori deductive codes derived from the three-dimensional conceptual framework (technical-pedagogical, legal-openness, ethical-citizenship) with data-driven inductive codes.
5	Codebook piloting	The codebook was piloted on the text's first two paragraphs before being applied to the entire document, to ensure that theme categories were sufficiently clear and did not overlap excessively.

In interpretive qualitative research, the researcher serves as the primary instrument for data collection and analysis (researcher-as-instrument), supported by the codebook described above. Inductive codes were allowed to emerge from the data when they fell outside the three predefined dimensions, as occurred with the finding on the generational gap between teachers and students in digital familiarity.

Data Analysis

The research procedure followed Braun and Clarke's (2006) six thematic-analysis phases in sequence, allowing replication by other researchers. In the third phase, generating initial codes, every sentence segment containing a substantive claim received a short descriptive code, combining deductive codes from the codebook with inductive codes emerging from the data. In the fourth phase, theme searching, related codes were grouped into candidate themes. For example, the codes "PowerPoint as an administrative tool" and "minimal digital interaction" were merged into the candidate theme "technology oriented as a tool rather than a learning goal." The fifth phase, theme review, involved re-examining candidate themes against the entire dataset to confirm internal coherence, meaning that data within one theme relate meaningfully to each other, and external distinction, meaning that boundaries between themes remain sufficiently clear. This phase also compared themes against the three-dimensional conceptual framework from the literature review. Finally, in the phase of defining, naming, and writing the thematic narrative, each final theme received a name and a brief operational definition, then was written as a thematic narrative accompanied by representative direct quotations as textual evidence, as presented in the results section.

Analysis proceeded manually using a structured spreadsheet that mapped columns for original quotations, initial codes, candidate themes, and analytic notes. No qualitative data analysis software was used, given the relatively small data scale of a single document. Because the data consist of a single, fully published text, missing data in the quantitative sense did not arise. The more relevant issue involved handling ambiguous or potentially multi-interpretable text segments. Such segments were handled through two steps: (a) retaining the full surrounding sentence context during coding to minimize meaning fragmentation, and (b) explicitly flagging segments that remained ambiguous after re-reading as interpretive limitations, rather than forcing a single meaning onto them.

To strengthen the trustworthiness of the analysis, this study applied several validation strategies consistent with Lincoln and Guba's (1985) criteria. Credibility was addressed through prolonged engagement with the text (repeated reading across the familiarization phase) and through piloting the codebook before full-scale coding. Dependability was supported by maintaining an audit trail in the form of a structured spreadsheet documenting quotations, codes, candidate themes, and analytic

decisions at each phase. Confirmability was pursued by explicitly separating deductive codes drawn from the conceptual framework from inductive codes emerging from the data, reducing the risk that findings merely reflect the researcher's prior assumptions. As the analysis relied on a single researcher and a single data source without investigator triangulation or member-checking with the informants, these limitations are acknowledged and revisited in the Conclusion.

RESULTS AND DISCUSSION

Research Results

The data for this study came from a talk show titled *"Indonesian Education Toward a Golden Indonesia or an Anxious Indonesia?"*, held at Building A of the Ministry of Primary and Secondary Education, Central Jakarta, on Thursday, 15 May 2025. This event was selected as the unit of analysis because it contains direct statements from two key informants representing two different perspectives on the teacher digital-divide issue: the Head of Program Development at Guru Binar, Putera Sampoerna Foundation, representing the practitioner and education-observer perspective, and the Director of Junior Secondary Education at the Directorate General of Early Childhood, Primary, and Secondary Education, representing the regulator and policymaker perspective. The data context was further supported by macro-level statistics from the World Bank, which state that Indonesia still needs approximately nine million digital talents; this figure underlies the urgency of the issue both informants discussed. The analysis followed a thematic approach, in which informant statements were read repeatedly, coded, and grouped into themes reflecting the research questions on the forms, causes, and policy responses related to the teacher digital divide.

Table 2. Summary of thematic findings

Theme	Core finding	Representative evidence	Informant
1. Digital literacy competence gap as a fundamental problem	Teacher digital literacy competence remains the central unresolved issue, with downstream risk of student plagiarism and disinformation	<i>"The digital literacy gap is still high. Teachers' digital literacy competence still needs improvement."</i>	Informant 1 (practitioner)
2. Technology as an administrative tool	Technology use stays limited to administrative functions, such as making a PowerPoint, without corresponding pedagogical transformation	<i>"They just make a PowerPoint (PPT), but there is no digital interaction during learning."</i>	Informant 1 (practitioner)
3. Risk of teachers falling behind students	The digital familiarity gap is bidirectional; teachers risk falling behind students, who act as digital natives	<i>"Teachers must not fall behind students... students are already deeply attached to digital platforms."</i>	Informant 1 (practitioner)
4. Policy response emphasizing infrastructure distribution	Government policy under Presidential Instruction No. 7/2025 targets device and infrastructure distribution to approximately 330,000 institutions, without explicit competence indicators	<i>"We will assist approximately 330 thousand educational institutions... related to learning digitalization."</i>	Informant 2 (regulator)

The first prominent theme concerns the claim that the teacher digital literacy gap remains a central unresolved issue in Indonesia's digital education ecosystem. Informant 1 stated, "What is our homework? Our homework is one: the digital literacy gap is still high. Teachers' digital literacy

competence still needs improvement." This statement indicates that the problem lies not merely in infrastructure availability but in teachers' competence to use digital literacy substantively. Informant 1 also linked this theme to its downstream effect on students, namely the risk of plagiarism and disinformation if teacher competence is not improved, suggesting that the gap at the teacher level may transmit to the student level.

Related to this theme, the analysis also found a pattern of misdirected orientation in some teachers' technology use. Informant 1 highlighted that teachers should not treat technology merely as a tool. For example, they just make a PowerPoint (PPT), but there is no digital interaction during learning, when what they hope for is not the tool itself but the learning objective. This finding reveals a pattern of administrative and ceremonial technology use, limited to producing presentation materials, without a corresponding transformation toward more interactive teaching methods (Erwinda et al., 2026). In other words, owning digital tools does not automatically produce a shift in pedagogical paradigm. A gap therefore appears between technology access and the competence to use it meaningfully.

The next finding stands in contrast to the others and deserves equal weight, since it depicts a reality that potentially contradicts the normative expectation that teachers automatically serve as the primary reference point for digital literacy. Informant 1 warned that "teachers must not fall behind students," because "students are already deeply attached to digital platforms for learning." The gap in question is therefore bidirectional. It exists not only between teachers and digital resources but also between teachers and students as digital natives. Consequently, one cannot simply assume that teachers always hold a more advanced position than students in digital familiarity (Rodríguez-Alvarez et al., 2026).

On the policy side, Informant 2 explained that the Ministry of Primary and Secondary Education is currently implementing a digitalization-strengthening program based on the Presidential Instruction. According to Informant 2, "based on the presidential instruction, we will assist approximately 330 thousand educational institutions across all levels, from early childhood education to senior secondary and vocational schools, including special schools for students with disabilities (SLB). These institutions receive assistance related to learning digitalization." This assistance extends beyond hardware provision and also covers digital learning content development. This finding indicates a structural policy effort. No concrete indicator addresses the specific mechanism for improving teacher competence, however, revealing a gap between supply-side infrastructure provision and competence-side digital literacy strengthening, which was the central concern raised in the first theme (Žmavc & Bezljaj, 2026). It should be noted that Informant 2's statements in this dataset were more consistently paraphrased around policy substance, whereas Informant 1's statements were more frequently available as extended verbatim quotations. This asymmetry reflects the structure of the source transcript itself rather than a deliberate selection bias, but it means the relational reading that follows should be interpreted as an emphasis pattern rather than a fully symmetrical comparison of both informants' discourse.

A cross-theme reading reveals an emphasis gap between competence-oriented, pedagogical solutions, stressed by Informant 1 through mindset change and content mastery among teachers, and infrastructure-oriented, administrative solutions, stressed by Informant 2 through policy-based digitalization assistance distribution. The success indicators each informant referenced also differ: Informant 1 emphasized learning interaction and reduced plagiarism or disinformation, while Informant 2 emphasized the number of assisted institutions, reaching approximately 330 thousand. These two perspectives do not directly conflict with each other. They have not yet shown an explicit point of convergence, however, on how infrastructure strengthening will translate into measurable improvements in teacher digital literacy competence.

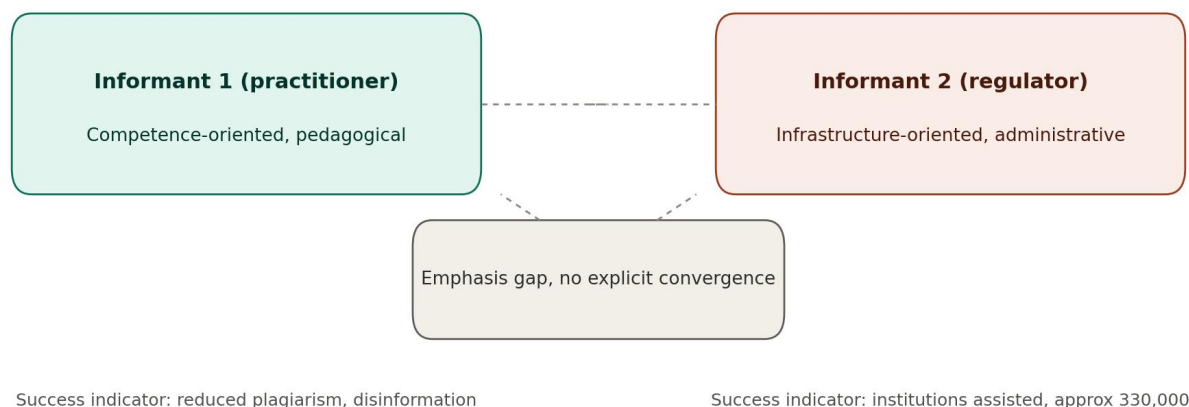


Figure 1. Emphasis Gap

Discussion

The four themes identified above collectively reveal an emphasis gap between the education practitioner perspective, oriented toward strengthening pedagogical competence, and the regulator perspective, oriented toward strengthening device provision. Overall, these findings reveal an emphasis gap between the education practitioner perspective, oriented toward strengthening pedagogical competence, and the regulator perspective, oriented toward strengthening device provision.

The finding on teacher digital literacy competence gaps aligns with and reinforces several recent studies, which consistently show that structural barriers in teacher digital education persist even as technology access expands (Endrawati Subroto et al., n.d.). This finding also reinforces the argument of Val & López-Bueno (2024). Based on a survey of 325 teachers and pre-service teachers in Spain, Cyprus, and Mexico, these authors concluded that teachers generally receive technical training related to their profession but lack adequate training to address the digital divide itself. This convergence across geographic contexts, from Indonesian policy discourse to quantitative surveys in three different countries, adds weight to the argument that teacher competence problems cut across contexts rather than remaining Indonesia-specific, a pattern also documented among basic-school teachers in other developing-country school systems (Nii Akai Netey et al., 2024). Meanwhile, the finding on technology use that stops at the administrative stage extends, rather than merely confirms, the TPACK literature discussed in the literature review. Earlier studies (Clipa et al., 2023; Peng et al., 2023) measured TPACK gaps through scaled survey instruments. This study, in contrast, shows how education practitioners articulate that gap themselves, in everyday language, as a phenomenon of "just making a PPT" without meaningful digital interaction. This articulation offers a qualitative nuance that survey scores alone cannot capture. It also reinforces second-level digital divide theory, which holds that the gap shifts from access to usage skills (van de Werfhorst et al., 2022). This study's findings may be positioned as qualitative evidence for a third-level digital divide in the Indonesian education sector, a gap in the real outcomes and benefits gained from technology use, rather than merely a gap in access or technical skill.

Because this study is qualitative-interpretive rather than correlational in design, claims about the mechanisms behind the findings are offered as plausible theoretical interpretations, not as statistically tested causal claims. The "technology as administrative tool" pattern may be explained through the mechanism proposed by Masoumi & Noroozi (2025): teachers' professional digital competence development depends heavily on the availability of structured, ongoing training. Without such training, teachers tend to adopt technology at the most accessible and lowest-risk level, namely administrative use, rather than at a level demanding pedagogical redesign. Alternative explanations, such as generational resistance to new tools or institutional culture discouraging pedagogical risk-taking, cannot be entirely ruled out from discourse data alone. However, the training-availability

explanation aligns more closely with Informant 1's own framing of the problem as a competence gap rather than an attitudinal one, lending it greater interpretive coherence with the data at hand. This pattern is corroborated by qualitative evidence from other developing-country contexts, where teachers similarly frame technology primarily as a productivity tool for lesson preparation rather than a vehicle for pedagogical transformation (Abedi et al., 2024). This mechanism is consistent with evidence that teachers' self-efficacy toward technology does not automatically rise simply because devices become available (Clipa et al., 2023). This evidence suggests that the path from tool availability to changed teaching practice is not direct but is mediated by training and teacher confidence factors. This proposition aligns with this study's initial working proposition, though it still requires further empirical testing to confirm the direction of that mediation.

One finding that does not fully align with normative expectations in the literature is the explicit warning that teachers risk falling behind students in digital familiarity. Much policy literature generally positions teachers as the party who automatically becomes students' digital literacy reference point, an assumption implicit in both the TPACK framework and supply-based digitalization policy. This study's finding, however, reverses that assumption. A plausible explanation can be traced to literature on cross-generational digital divides, which shows that students, as digital natives, develop digital skills informally and rapidly through everyday exposure outside school, while teachers tend to acquire digital skills through slower, formal channels dependent on institutional training availability (Marrero Galván et al., 2023; Momdjian et al., 2024; Val & López-Bueno, 2024). Rather than downplaying this contrasting finding to fit the more dominant teacher-gap-versus-infrastructure-gap narrative found in other themes, this study preserves it as an equally important finding. It demonstrates, after all, that the direction of policy intervention should not assume a linear "teacher teaches student" relationship, but instead must accommodate the possibility of bidirectional digital learning.

The teacher digital divide in Indonesia is not a single problem solvable through device distribution alone. This study's findings indicate that, as long as policy solutions continue to emphasize infrastructure supply without explicitly and measurably targeting the transformation of teachers' pedagogical-digital competence, including open-educational-resource literacy, which remains nearly inaudible in public discourse, the emphasis gap between practitioners and regulators will keep recurring. The risk of teachers falling behind their own students in digital familiarity will not be resolved merely by sending more devices to more schools.

IMPLICATION

Theoretical Implications

This study contributes to digital divide theory in two ways. First, it offers an empirical illustration, grounded in Indonesian education discourse, of the shift from access to skill and outcome levels. This shift extends earlier survey-based accounts of the second-level digital divide. Second, the study introduces a dimension rarely addressed within TPACK or conventional digital-divide frameworks: legal-openness, covering OER and FOSS/copyleft literacy. This dimension remains almost absent from practitioner-regulator discourse, a silence that itself carries theoretical weight. It suggests that the policy-level conception of teacher digital literacy stays narrower than the academic framework guiding this study. These contributions sharpen and extend existing theory rather than establish a new one, a single unit of analysis cannot support a claim to full theoretical novelty.

Practical and Policy Implications

For practitioners and policymakers, the findings point toward several concrete actions. Teacher training programs accompanying device distribution under Presidential Instruction Number 7 of 2025 should explicitly target the shift from administrative to pedagogically transformative technology use. Case-based training modules on designing digital interaction may serve this purpose better than instruction limited to presentation software. Because OER, FOSS, and copyright literacy barely appear in current policy discourse, training curricula could also incorporate a short module on the 5R framework and open licensing.

Beyond classroom-level steps, the findings carry implications for policy design. The Ministry of Primary and Secondary Education could revise the monitoring framework under Presidential Instruction Number 7 of 2025 to include competence-based indicators, such as documented change in teachers' instructional technology use, alongside existing device-distribution targets. Without such indicators, the program risks being evaluated on reach alone rather than on pedagogical impact. Furthermore, because the findings reveal a generational gap in digital familiarity between teachers and students, schools might consider a reverse-mentoring scheme in which students structurally support teachers' digital skill development. These recommendations are specific and actionable, whether pursued by the Ministry or by individual schools. Their effectiveness, however, still requires testing through further intervention research before wide adoption.

CONCLUSION

This study set out to identify the forms of the teacher digital literacy gap, to analyze the relational pattern between practitioner and regulator perspectives, and to formulate policy implications for strengthening that literacy. The findings show that the gap is not a single problem but a multidimensional one, spanning teacher competence, the orientation of technology use, and generational digital familiarity, and that it cannot be reduced to an infrastructure issue alone. The findings further show that practitioner and regulator perspectives relate through a persistent emphasis gap: practitioners prioritize pedagogical competence, while regulators prioritize device distribution, with no explicit mechanism connecting the two. Building on this, the study concludes that strengthening teacher digital literacy requires policy indicators that measure pedagogical-competence change directly, rather than infrastructure reach alone.

This study's significance lies in how it addresses the three gaps identified in the introduction. Rather than measuring teacher digital competence determinants through self-report survey instruments, as has dominated the prior literature, this study captures how that competence is debated directly by practitioners and regulators within the same forum, offering a discursive depth that survey scores cannot capture. This study also represents one of the first attempts to explicitly place open-educational-resource and open-source-software literacy (OER/5R, FOSS/copyleft, copyright exceptions) alongside general teacher digital-competence discourse within the Indonesian primary and secondary education context. This dimension remains nearly inaudible in public policy discourse, a gap that stands as an important finding in its own right, not merely as a supplementary note.

Theoretically, these findings reinforce and contextualize the theory of digital-divide shift from the access level toward the skill and outcome levels within Indonesian education policy. Practically, the findings confirm that device-distribution-oriented education digitalization programs need to be paired with success indicators that explicitly measure changes in teachers' pedagogical-digital competence, rather than merely counting recipient schools. This study's limitation, namely its reliance on a single unit of analysis without source triangulation, does not diminish the validity of the findings as an initial thematic exploration. It does, however, point directly toward avenues for further research: testing the same patterns through direct interviews with a broader sample of teachers, and conducting longitudinal analysis of Indonesian digital education policy documents over time. Another methodological limitation that must be explicitly acknowledged concerns the verbatim quotation representation in the Results section, which draws more heavily from one informant, the practitioner perspective, than from the second informant, the regulator perspective. Consequently, claims about cross-perspective relational patterns rest largely on paraphrase rather than direct quotation for the regulator side. Further research should ensure a balanced representation of verbatim quotations from both parties to strengthen the validity of cross-perspective analysis.

Ultimately, these findings carry relevance beyond the academic sphere alone. Amid the state's commitment to allocating resources for digitalizing hundreds of thousands of educational institutions in pursuit of the nine-million-digital-talent national target, this study warns that investing in devices without an equivalent investment in the people who operate them risks producing schools that are physically connected to the internet yet remain pedagogically behind. Teachers whose competence

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goes unstrengthened risk not only failing to use technology meaningfully but also losing pedagogical authority before students who are already more digitally familiar. The teacher digital divide is therefore not simply a technical issue resolved by device delivery; it is an issue concerning the sustainability of the teaching profession itself in the digital era. It is precisely at this point that this study finds its most tangible urgency.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI) tools were used in the preparation, analysis, or writing of this manuscript. All aspects of the research, including data collection, interpretation, and manuscript preparation, were carried out entirely by the authors without the assistance of AI-based technologies.

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