

STRENGTHENING TEACHER PROFESSIONALISM IN INDONESIAN PRIMARY EDUCATION IN THE DIGITAL ERA: A SYSTEMATIC LITERATURE REVIEW OF DIGITAL COMPETENCE, PROFESSIONAL DEVELOPMENT, AND INSTITUTIONAL SUPPORT

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ABSTRACT

Teacher professionalism is increasingly important for improving primary education quality amid digital transformation and changing educational demands. This study aims to synthesize evidence on challenges and strategies for strengthening teacher professionalism in Indonesian primary education. A Systematic Literature Review (SLR) was conducted following the PRISMA 2020 framework. Literature published between 2020 and 2025 was retrieved from Scopus, ERIC, Google Scholar, and SINTA using predetermined inclusion and exclusion criteria. From 156 initial records, 37 peer-reviewed studies were included in the final synthesis and analysed through thematic analysis. The findings identified five interconnected themes: professional competence, digital competence, continuous professional development, educational leadership, and institutional support. The review shows that teacher professionalism is strengthened through the interaction of individual competencies, continuous professional learning, supportive leadership, and institutional conditions that facilitate effective technology integration and adaptation to

educational change. The novelty of this review lies in its integrated framework linking these five dimensions as mutually reinforcing components of sustainable teacher professionalism in Indonesian primary education. The findings imply that policymakers, school leaders, teacher education institutions, and teachers should develop continuous, collaborative, and institutionally supported professional learning systems to improve instructional quality and sustain teacher professionalism in the digital era.

Keywords: *Continuous Professional Development, Digital Competence, Primary Education, Teacher Professionalism, Thematic Analysis*

How to Cite Kamilah, N. 'Isrina, Khasanah, S. R., & Mukhbitah, I. (2026). Strengthening Teacher Professionalism In Indonesian Primary Education In The Digital Era: A Systematic Literature Review Of Digital Competence, Professional Development, And Institutional Support. *Al-Mubtadi: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, 4(1), 691–719.
<https://doi.org/10.58988/almubtadi.v4i1.1218>

INTRODUCTION

Teacher professionalism has emerged as a strategic pillar in improving the quality of primary education worldwide, particularly as schools respond to rapid technological advancement, curriculum reform, and increasingly diverse learning needs. Professional teachers are expected not only to demonstrate strong pedagogical and subject-matter knowledge but also to integrate digital technologies, foster critical thinking, and create inclusive learning environments that support student holistic development. These expanding responsibilities require educators to continuously update their competencies and adapt instructional practices to changing educational contexts. International organizations have consistently emphasized that the quality of teachers remains an important school-based factor affecting student academic achievement and lifelong learning outcomes. Consequently, strengthening teacher professionalism has become a global priority, encouraging governments and educational institutions to invest in sustainable professional development, digital capacity building, and collaborative learning communities to enhance instructional effectiveness and educational quality (Ibda et al., 2023; Tondeur et al., 2021)

Indonesia has undertaken substantial educational reforms to improve teacher quality through certification programs, continuous professional development initiatives, and the implementation of competency-based policies. Despite these efforts, strengthening teacher professionalism remains a persistent challenge, particularly in primary education where teachers are expected to fulfil multiple instructional, administrative, and social responsibilities. The rapid expansion of digital learning environments has further increased expectations for teachers to master digital pedagogy, integrate

technology into classroom practices, and respond effectively to diverse student characteristics. Recent studies indicate that many primary school teachers continue to experience difficulties in applying innovative teaching approaches due to disparities in digital competence, limited access to professional learning opportunities, inadequate institutional support, and uneven technological infrastructure across regions (Ibda et al., 2023; Rahayu et al., 2025). These conditions suggest that improving teacher professionalism requires more than strengthening individual competencies; it also depends on sustainable professional development, supportive educational leadership, and policies that facilitate continuous learning and instructional innovation within Indonesian primary schools.

Previous studies have extensively examined teacher professionalism from various perspectives, including professional competence, digital competence, professional development, and educational leadership. Systematic reviews have highlighted the increasing importance of digital competence and professional learning in responding to technological transformation in education (Ibda et al., 2023; Tondeur, J. et al., 2021) for example, reviewed research on professional elementary teachers in the digital era and emphasized the importance of professional competence, professional development, and digital competence. More recently, Aminah et al. (2025) conducted a systematic review and proposed an Integrated Professional Development Model that connects several dimensions of teacher professionalism in the digital age. Empirical studies have also emphasized the influence of school leadership, organizational support, and access to professional learning opportunities on teachers motivation and capacity to develop their competencies and implement innovative pedagogical practices (Mulyaningrum et al., 2025; Rahayu et al., 2025) These studies provide important foundations for understanding contemporary teacher professionalism; however, differences in their educational contexts, review scopes, and conceptual emphases indicate that further synthesis is needed to examine how these dimensions interact specifically within Indonesian primary education.

Despite the growing body of research on teacher professionalism, several conceptual and contextual gaps remain.

Previous reviews have addressed digital competence, professional development, elementary teacher professionalism, and integrated professional learning models, but they have not provided a sufficiently focused synthesis of how professional competence, digital competence, continuous professional development, educational leadership, and institutional support collectively shape teacher professionalism within Indonesian primary education. In addition, some previous reviews encompass broader educational levels or international contexts, making it difficult to identify the specific professional demands and enabling conditions experienced by primary school teachers in Indonesia. The rapid integration of digital technologies further requires teacher professionalism to be understood not only in terms of individual competencies but also in relation to continuous professional learning and the organizational conditions that enable teachers to apply and sustain those competencies. Therefore, a systematic synthesis focusing specifically on Indonesian primary education is necessary to clarify the interconnected factors and strategies that support sustainable teacher professionalism in the digital era.

This review seeks to address these limitations by providing a comprehensive synthesis of recent evidence on teacher professionalism in Indonesian primary education from an integrated perspective. Rather than examining individual aspects in isolation, the study brings together findings related to professional competence, digital competence, continuous professional development, educational leadership, and institutional support to explain how these dimensions collectively shape teacher professionalism in the digital era. The review also draws on established perspectives of teacher and digital competence. In particular, the 'Teacher Digital Competency framework emphasizes that teachers' digital competence extends beyond technical skills to include the meaningful integration of digital technologies into teaching, learning, and professional practice (Falloon, 2020). This perspective supports the conceptualization of digital competence as an integral component of contemporary teacher professionalism. By synthesizing empirical and review studies published between 2020 and 2025, this article provides an updated conceptual understanding of the interrelationships among these factors while emphasizing the

distinctive characteristics of Indonesian primary education. Consequently, the findings are expected to contribute to the academic discourse on teacher professionalism and provide evidence-informed recommendations for policymakers, school leaders, and teacher education institutions in designing sustainable professional development initiatives.

Building upon the identified research gap, this study aims to systematically synthesize recent evidence regarding the challenges and strategies for strengthening teacher professionalism in Indonesian primary education during the digital era. Specifically, the review seeks to examine how professional competence, digital competence, continuous professional development, institutional support, and educational leadership interact in shaping sustainable teacher professionalism. By integrating findings from empirical studies and systematic reviews published between 2020 and 2025, this study intends to develop a comprehensive understanding of current research trends, identify recurring challenges, and highlight effective strategies that can support teacher development in Indonesian primary schools. The findings are expected to provide meaningful theoretical contributions by enriching the discourse on teacher professionalism while offering practical implications for educational policymakers, school leaders, teacher education institutions, and classroom practitioners. Ultimately, this review serves as an evidence-based reference for designing sustainable policies and professional learning initiatives that enhance educational quality and prepare teachers to respond effectively to the evolving demands of the digital era.

METHOD

This study employed a Systematic Literature Review (SLR) to systematically identify, evaluate, and synthesize recent evidence concerning teacher professionalism in Indonesian primary education during the digital era. The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to ensure a transparent and systematic process of identification, screening, eligibility assessment, and study inclusion. The review focused on empirical and review studies published between 2020 and 2025 that examined teacher

professionalism and its related dimensions, including professional competence, digital competence, continuous professional development, educational leadership, and institutional support within primary education.

The literature search was conducted during June and July 2026 using four academic databases: Scopus, ERIC, Google Scholar, and SINTA. These databases were selected to obtain relevant international and Indonesian literature concerning teacher professionalism, digital competence, professional development, and primary education. The search strategy employed combinations of keywords related to teacher professionalism, teacher competence, digital competence, professional development, primary or elementary education, educational leadership, and the Indonesian context. Boolean operators AND and OR were used to combine related concepts and broaden or narrow the search results. The core search string used across the databases was formulated as follows: ("teacher professionalism" OR "teacher competence" OR "professional competence") AND ("digital competence" OR "digital literacy" OR "digital pedagogy") AND ("professional development" OR "continuous professional development" OR "professional learning") AND ("primary education" OR "primary school" OR "elementary education" OR "elementary school") AND (Indonesia OR Indonesian)

The search terms were adapted to the search functions and indexing characteristics of each database while maintaining the same core conceptual components. The search was limited to publications from 2020 to 2025 and focused on studies relevant to teacher professionalism, digital transformation, and primary education. The search results from the four databases were subsequently combined for screening and duplicate removal.

Predefined inclusion and exclusion criteria were applied to ensure consistency and transparency during the study-selection process. Studies were included when they met the following criteria: (1) published between 2020 and 2025; (2) published as peer-reviewed journal articles; (3) written in English or Indonesian; (4) focused on primary or elementary education; and (5) addressed teacher professionalism, teacher competence, digital competence, professional development, educational leadership, institutional

support, or related issues concerning teacher development and digital transformation.

Studies were excluded when they (1) were published outside the 2020–2025 period; (2) were not peer-reviewed journal articles; (3) focused on educational levels other than primary or elementary education; (4) were written in languages other than English or Indonesian; or (5) did not address teacher professionalism or its relationship with digital transformation and professional development. The eligibility criteria were applied progressively during title and abstract screening and full-text assessment. This procedure ensured that the final studies were sufficiently aligned with the objectives and scope of the review.

The study-selection process followed the PRISMA 2020 framework. The initial search across the four databases identified 156 records. After the removal of 18 duplicate records, 138 records remained for title and abstract screening. During the screening stage, 89 records were excluded because they did not meet the predetermined eligibility criteria. The primary reasons for exclusion included lack of relevance to teacher professionalism, inconsistency with the specified publication period, focus on educational levels other than primary education, and insufficient relevance to teacher professionalism in the context of digital transformation. The remaining 49 articles were retrieved and assessed through full-text examination. At this stage, 12 articles were excluded because they did not demonstrate sufficient alignment with the review objectives, methodological requirements, or contextual focus of the study. Consequently, 37 studies met the eligibility requirements and were included in the final synthesis and thematic analysis. Thus, the final selection process consisted of the following stages:

156 identified records → 18 duplicates removed → 138 records screened → 89 records excluded → 49 full-text articles assessed → 12 articles excluded → 37 studies included in the review.

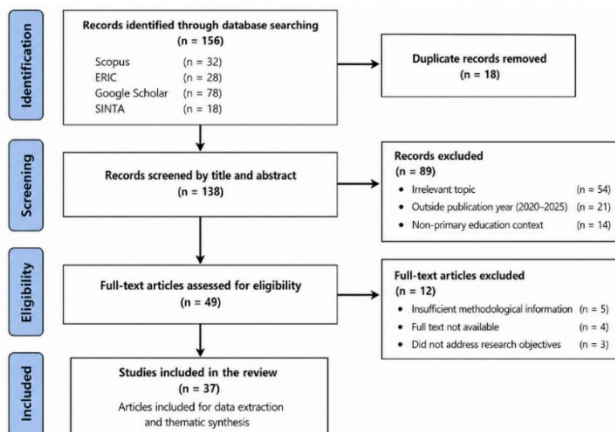


Figure 1.

PRISMA 2020 Flow Diagram of the Study Selection Process

Quality assessment was conducted during the full-text stage based on three criteria: clarity of research objectives, methodological rigor, and relevance to the review focus. Studies that did not meet these criteria were excluded from the final synthesis during the full-text assessment, 12 of the 49 articles were excluded based on their eligibility and quality considerations, leaving 37 studies for the final analysis. Data were systematically extracted from the 37 included studies, covering authors, publication year, country, research design, participants, research focus, and principal findings. The extracted data were organized to facilitate cross-study comparison and identify relevant patterns concerning teacher professionalism and digital transformation.

The extracted findings were analyzed thematically through four stages: initial coding, grouping related codes into categories, comparing categories across studies, and consolidating them into overarching themes. The analysis focused on recurring concepts, similarities, differences, and emerging patterns related to teacher professionalism. Five major themes emerged: (1) professional competence, (2) digital competence, (3) continuous professional development, (4) educational leadership, and (5) institutional support. These themes were synthesized to examine how individual

competencies, professional learning, leadership, and institutional conditions collectively contribute to sustainable teacher professionalism in Indonesian primary education.

RESULTS AND DISCUSSION

RESULT

Overview of the Included Studies

The systematic review included 37 peer-reviewed journal articles published between 2020 and 2025, all of which satisfied the predetermined inclusion and exclusion criteria. These studies originated from both national and international contexts, providing a comprehensive perspective on the development of teacher professionalism in primary education during the digital era. The selected publications employed diverse research designs, including qualitative, quantitative, mixed-methods, systematic literature reviews, and meta-analyses, allowing the review to capture methodological diversity and enrich the synthesis of evidence. Most studies emphasized that teacher professionalism is a multidimensional construct influenced by pedagogical competence, digital competence, continuous professional development, educational leadership, and institutional support. Although the studies differed in research settings and analytical approaches, they consistently highlighted the importance of equipping teachers with adaptive competencies to respond to technological advancement and evolving educational demands (Aminah et al., 2025; Ibda et al., 2023; Junaidi et al., 2024; Mulyaningrum et al., 2025). This diversity of evidence provides a strong foundation for identifying common patterns and developing an integrated understanding of teacher professionalism in Indonesian primary education.

Table 1. General Characteristics of the Included Studies

Variable	Description
Number of studies	37
Publication period	2020–2025
Databases	Scopus, ERIC, Google Scholar, SINTA
Research designs	Qualitative, Quantitative, Mixed Methods, SLR, Meta-analysis
Educational level	Primary Education

Variable	Description
Main themes	Teacher Professionalism, Digital Competence, CPD, Educational Leadership, Institutional Support

1. Professional Competence as the Foundation of Teacher Professionalism

The reviewed studies consistently identified professional competence as the fundamental dimension underpinning teacher professionalism in primary education. Beyond mastery of subject matter, professional competence encompasses pedagogical expertise, curriculum implementation, reflective practice, ethical responsibility, and the capacity to respond to continuously evolving educational demands. Across the selected studies, teachers who demonstrated strong professional competence were more likely to design meaningful learning experiences, employ diverse instructional strategies, and facilitate active student participation. Furthermore, professional competence was frequently associated with teachers' ability to integrate technological innovations into classroom practice while maintaining learner-centre instruction. Rather than functioning as an isolated attribute, this competence was found to interact closely with teacher commitment to lifelong learning and their willingness to adapt to educational reforms. However, the reviewed studies differed in their emphasis on how professional competence is developed. While some studies highlighted individual factors such as teacher motivation, reflective capacity, and commitment to lifelong learning, others emphasized institutional conditions, including leadership, mentoring, supervision, and collaborative professional learning (Aminah et al., 2025; Anas, 2023; Budihartono et al., 2025; Rigianti & Nisa 2023; Sukarno et al., 2025; Syoviana et al., 2025). Consequently, professional competence emerged not only as a prerequisite for effective teaching but also as the foundation upon which other dimensions of teacher professionalism, including digital competence and professional development, could be successfully developed (Ibda et al., 2023; Mulyaningrum et al., 2025; Rahayu et al., 2025).

The synthesis also revealed that the development of professional competence is influenced by both individual and

institutional factors. At the individual level, teachers' motivation, reflective capacity, and commitment to continuous learning significantly contributed to sustained professional growth. Meanwhile, institutional factors including supportive school leadership, access to professional development programmes, collaborative learning communities, and constructive supervision created conditions that enabled teachers to improve their instructional practices. Several studies further reported that schools encouraging collaborative reflection and continuous professional learning were more successful in fostering innovative teaching practices than schools relying solely on administrative supervision. These findings indicate that strengthening professional competence requires a comprehensive approach integrating personal initiative with systemic educational support (Fitriyah et al., 2025; Sitorus, 2023; Syoviana et al., 2025) This suggests that professional competence is not solely an individual attribute but develops through the interaction between teacher agency and institutional support. Therefore, enhancing teacher professionalism should be viewed as a collaborative process involving teachers, school leaders, policymakers, and teacher education institutions to ensure sustainable improvements in instructional quality (Abu Siri et al., 2020; Aminah et al., 2025; Debrianti & Abdussabir, 2024; Muslikah et al., 2025; Syahputra & Maskhuliah, 2023)

Table 2. Thematic Synthesis of Professional Competence

Theme	Evidence from the Reviewed Studies	Educational Implications
Professional competence	Effective teaching is supported by pedagogical knowledge, subject mastery, reflective practice, and ethical responsibility.	Teachers should continuously improve pedagogical and professional competencies through structured learning activities.
Continuous learning	Lifelong learning and reflective practice strengthen teachers'	Schools should promote continuous professional learning

Theme	Evidence from the Reviewed Studies	Educational Implications
Institutional support	adaptability to educational change. School leadership, mentoring, supervision, and collaborative learning communities positively influence professional competence.	as part of teacher career development.
		Educational institutions should establish sustainable professional support systems for teachers.
Professionalism outcomes	Strong professional competence contributes to instructional quality, student engagement, and educational effectiveness.	Professional competence should become a strategic priority in educational policy and teacher development programmes.

2. Digital Competence as a Key Driver of Teacher Professionalism

The synthesis of the selected studies demonstrated that digital competence has evolved into one of the most influential dimensions of teacher professionalism in contemporary primary education. Rather than merely operating digital devices, digital competence encompasses teacher ability to select appropriate technologies, design interactive learning experiences, evaluate digital learning resources, and promote responsible technology use among students. The reviewed evidence consistently showed that educators with stronger digital capabilities were more effective in facilitating collaborative learning, encouraging higher-order thinking, and adapting instruction to students diverse learning needs. Moreover, digital competence enabled teachers to maintain instructional continuity during educational disruptions while supporting flexible and learner-centred pedagogical practices. These findings suggest that technological capability should be viewed as an integral component of professional competence rather than an additional

technical skill, particularly as digital transformation continues to reshape educational systems worldwide (Bentri et al., 2025; Erviana et al., 2025; Ibda et al., 2023; Junaidi & Jamaludin, 2024; Mulyaningrum et al., 2025; Tondeur et al., 2021; Zhao Y. & Bryant, 2021)

However, the evidence also reveals a divergence between the possession of digital competence and its effective implementation in classroom practice. While some studies emphasize the contribution of digital competence to professional learning and instructional innovation, others highlight persistent challenges related to infrastructure, digital literacy, and access to professional development. Thus, digital competence alone does not guarantee effective technology integration; its impact also depends on pedagogical preparation and institutional support (Cabero-Almenara et al., 2020; Falloon, 2020; Fernández-Batanero et al., 2020)

The reviewed literature further revealed that the successful integration of digital technology depends not only on teacher individual capabilities but also on the availability of institutional support and sustainable professional learning opportunities. Several studies reported that educators participating in structured digital training programmes demonstrated greater confidence in implementing technology-enhanced instruction than those relying solely on self-directed learning. Likewise, supportive school leadership, adequate technological infrastructure, peer collaboration, and access to high-quality digital resources significantly strengthened teachers' readiness to innovate in classroom practice. Nevertheless, persistent disparities in infrastructure, unequal access to professional development, and varying levels of digital literacy continue to hinder the effective implementation of technology-based instruction, particularly in geographically disadvantaged areas. Consequently, strengthening digital competence requires coordinated efforts involving educational policymakers, school leaders, and teacher education institutions to ensure equitable access to digital resources and continuous capacity-building initiatives that sustain professional growth (Aminah et al., 2025; Darling et al., 2020; Rahayu et al., 2025).

Table 3. Thematic Synthesis of Digital Competence

Theme	Evidence from the Reviewed Studies	Educational Implications
Digital competence	Teachers require technological, pedagogical, and digital literacy skills to facilitate effective learning.	Digital competence should become an integral component of teacher professionalism.
Technology integration	Technology supports interactive, flexible, and student-centred learning environments.	Schools should encourage meaningful technology integration rather than focusing solely on digital tools.
Professional development	Structured digital training significantly improves teachers' confidence and instructional effectiveness.	Continuous digital professional development should be incorporated into teacher development programmes.
Institutional support	Leadership, infrastructure, technical support, and collaborative culture strengthen technology adoption.	Educational stakeholders should ensure equitable access to digital infrastructure and ongoing mentoring.

3. Continuous Professional Development as a Strategy for Sustainable Teacher Professionalism

The reviewed studies consistently identified Continuous Professional Development (CPD) as a fundamental strategy for sustaining teacher professionalism amid rapid educational transformation. Professional development was no longer perceived as participation in occasional training activities but as an ongoing learning process that enables teachers to refine pedagogical knowledge, strengthen instructional competence, and respond effectively to emerging educational challenges. Across the reviewed literature, teachers who actively engaged in structured professional

learning demonstrated greater instructional adaptability, stronger reflective practice, and higher confidence in implementing innovative teaching approaches. Moreover, CPD promoted continuous knowledge exchange through professional learning communities, mentoring programmes, collaborative lesson planning, and reflective discussions among colleagues. These activities encouraged teachers to evaluate their instructional practices critically while integrating new pedagogical knowledge into classroom implementation. Consequently, professional development emerged as a continuous cycle of learning, reflection, implementation, and evaluation that supports sustainable improvements in educational quality (Aminah et al., 2025; Darling-Hammond et al., 2017; Fernández-Batanero et al., 2020; Ibda et al., 2023; Muslikah et al., 2025; Rahayu et al., 2024; Tondeur et al., 2021)

The synthesis further indicated that the effectiveness of professional development programmes depends largely on their relevance to teachers instructional needs and the level of institutional commitment supporting their implementation. Several studies reported that conventional training programmes with limited follow-up activities produced minimal long-term changes in classroom practice. In contrast, sustained programmes integrating coaching, mentoring, peer observation, action research, and collaborative reflection generated more meaningful improvements in teaching performance and professional confidence (Nagel et al., 2025; Rugaiyah et al., 2025; Tambunan et al., 2022). This contrast suggests that the effectiveness of CPD depends more on continuity, relevance, and follow-up than on participation in training alone. School leaders also played a crucial role by creating supportive learning environments, allocating time for professional collaboration, and encouraging teachers to participate in continuous learning activities (Ajani O, 2024; Amemasor et al., Fitriyah et al., 2025) Despite these positive developments, disparities in access to high-quality professional development remain evident across different regions, particularly in schools with limited financial and technological resources. These findings suggest that sustainable teacher professionalism requires long-term professional learning ecosystems rather than isolated training initiatives, ensuring that teachers continuously develop the competencies needed to meet

evolving educational expectations (Junaidi et al., 2024; Mulyaningrum et al., 2025).

Table 4. Thematic Synthesis of Continuous Professional Development

Theme	Evidence from the Reviewed Studies	Educational Implications
Lifelong professional learning	Teacher professionalism develops through continuous learning rather than one-time training.	Professional development should become a continuous component of teachers' careers.
Professional Learning Communities (PLC)	Collaboration, peer discussion, and lesson study enhance instructional quality.	Schools should establish sustainable professional learning communities.
Mentoring and coaching	Continuous mentoring improves teachers' confidence and classroom performance.	Mentoring programmes should accompany formal professional development activities.
Reflective practice	Self-evaluation and classroom reflection encourage instructional improvement.	Reflective practice should be integrated into teacher performance evaluation systems.
Sustainability of CPD	Long-term programmes generate greater professional growth than short-term workshops.	Educational policies should prioritize sustainable and needs-based professional development.

4. Educational Leadership and Institutional Support in Strengthening Teacher Professionalism

The reviewed literature consistently demonstrated that educational leadership and institutional support are critical determinants of sustainable teacher professionalism. The reviewed literature consistently demonstrated that educational leadership and institutional support are critical determinants of sustainable teacher professionalism. While teachers are expected to continuously improve their competencies, the effectiveness of these efforts largely depends on the organizational environment in which they work. School leaders play a strategic role in establishing a professional culture that encourages collaboration, innovation, and continuous improvement. Rather than functioning solely as administrators, effective principals act as instructional leaders who facilitate mentoring, coordinate professional learning activities, provide constructive feedback, and create opportunities for teachers to engage in reflective practice (Panjaitan H. & Hafizzah, 2025; Rahayu et al., 2024; Rugaiyah et al., 2025). Across the reviewed studies, schools characterized by supportive leadership were more likely to promote innovative instructional practices, strengthen teacher motivation, and improve overall educational quality. Furthermore, institutional commitment to professional growth fostered a positive learning climate in which teachers were encouraged to experiment with new pedagogical approaches while maintaining high standards of professional responsibility (Darling Hammond et al., 2020; Junaidi et al., 2024; Rahayu et al., 2025).

Beyond leadership, institutional support was identified as a key enabling factor influencing teacher capacity to respond to educational change. The reviewed studies emphasized that adequate infrastructure, accessible professional development programmes, sufficient financial resources, effective supervision, and collaborative professional communities significantly contribute to teacher long-term professional growth. Conversely, limited institutional resources often reduced teacher opportunities to participate in professional learning and implement innovative instructional practices. This finding further indicates that individual competence and institutional capacity should be viewed as interdependent rather than separate dimensions of teacher professionalism. Several studies also indicated

that supportive educational policies strengthened collaboration among schools, universities, and government agencies, thereby expanding teachers access to evidence-based professional learning initiatives. These findings suggest that strengthening teacher professionalism requires an integrated educational ecosystem in which school leadership, institutional commitment, and public policy function synergistically to support continuous professional learning. Therefore, sustainable improvements in teacher professionalism can only be achieved when individual commitment is reinforced by organizational support and coherent educational policies that promote innovation, collaboration, and lifelong professional learning (Aminah et al., 2025; Ibda et al., 2023).

Table 5. Thematic Synthesis of Educational Leadership and Institutional Support

Theme	Evidence from the Reviewed Studies	Educational Implications
Instructional leadership	School leaders encourage mentoring, supervision, and professional collaboration.	Principals should function as instructional leaders rather than administrative managers.
Institutional support	Professional growth is strengthened through infrastructure, funding, and access to professional learning opportunities.	Schools and governments should provide sustainable institutional support for teacher development.
Collaborative culture	Professional learning communities and peer collaboration improve instructional quality and innovation.	Collaborative learning should become an integral part of school culture.
Educational policy	National and local policies influence teachers access to	Policymakers should formulate long-term

Theme	Evidence from the Reviewed Studies	Educational Implications
Sustainable professionalism	professional development and digital resources.	strategies that support equitable teacher professional development.
	Teacher professionalism develops through interactions between individual commitment and institutional support.	Teacher development programmes should integrate personal, organizational, and policy dimensions.

5. An Integrated Framework for Strengthening Teacher Professionalism in Indonesian Primary Education

The thematic synthesis revealed that teacher professionalism should be understood as a dynamic and interconnected system rather than a collection of independent competencies. Across the reviewed studies, professional competence emerged as the foundation that enables teachers to perform their instructional responsibilities effectively. This competence is further reinforced by digital competence, which equips teachers with the capacity to integrate technology into meaningful learning experiences and respond to the demands of twenty-first-century education. However, the findings consistently indicated that these competencies cannot be sustained without continuous professional development. Structured learning opportunities, collaborative professional communities, mentoring programmes, and reflective practice serve as essential mechanisms through which teachers continuously refine their knowledge, instructional skills, and professional identity. The review therefore demonstrates that teacher professionalism develops through an ongoing interaction between individual competence and continuous learning rather than through isolated professional activities alone (Darling Hammond et al., 2020; Tondeur et al., 2021).

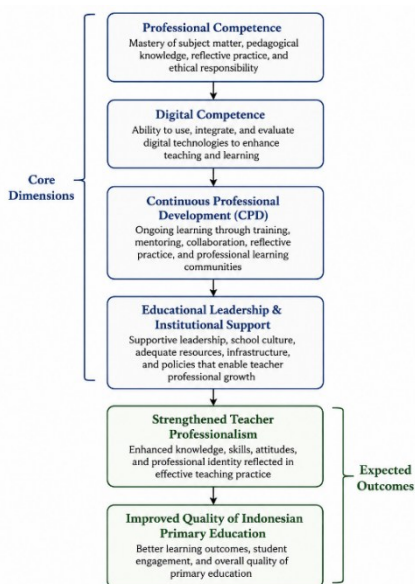


Figure 2. Integrated Conceptual Framework for Strengthening Teacher Professionalism

The synthesis also highlighted that sustainable teacher professionalism depends substantially on external conditions that support professional growth. Educational leadership, institutional commitment, supportive school culture, and coherent educational policies create an enabling environment in which teachers can apply newly acquired competencies and maintain continuous improvement. Schools providing mentoring systems, collaborative learning opportunities, adequate technological infrastructure, and access to professional development programmes consistently reported stronger instructional innovation and greater teacher engagement. Based on these findings, this review proposes an integrated conceptual framework in which professional competence, digital competence, continuous professional development, educational leadership, and institutional support function as mutually reinforcing dimensions that collectively strengthen teacher professionalism. Ultimately, the interaction among these dimensions contributes to improving instructional quality, fostering adaptive teaching practices, and enhancing the overall quality of primary education in Indonesia (Panjaitan & Hafizzah, 2025; Rahayu et al.,

2024; Rugaiyah et al., 2025). The proposed framework provides a conceptual reference that may guide future research as well as inform evidence-based policies for sustainable teacher professional development. The framework was derived from the convergence and divergence identified across the reviewed studies. It integrates individual competencies, continuous professional learning, and organizational conditions to explain how teacher professionalism can be developed and sustained in the digital era.

DISCUSSION

The synthesis presented in this review demonstrates that strengthening teacher professionalism in Indonesian primary education requires a holistic and interconnected approach rather than isolated competency improvement initiatives. The reviewed evidence consistently indicates that professional competence serves as the foundation for effective teaching, while digital competence enables teachers to respond to the demands of technology-enhanced learning. These competencies become sustainable only when supported by continuous professional development, collaborative learning opportunities, effective educational leadership, and adequate institutional support. Collectively, these dimensions interact to create a professional learning ecosystem that promotes instructional innovation, reflective practice, and continuous improvement. The comparison across the reviewed studies further suggests that these dimensions are mutually reinforcing rather than independent. Individual competencies may be strengthened through continuous professional learning, while leadership and institutional support determine whether such competencies can be effectively applied and sustained in practice.

The findings further indicate that professional competence should not be understood solely as mastery of subject matter. Instead, it encompasses pedagogical knowledge, curriculum implementation, reflective practice, ethical responsibility, and the ability to adapt to educational change. This interpretation suggests that professional competence is a dynamic construct that develops through continuous interaction between individual motivation and institutional support. Consequently, efforts to improve teacher professionalism should combine individual capacity-building with

organizational systems that encourage collaboration, mentoring, and reflective learning.

Digital competence also emerges as an essential component of contemporary teacher professionalism. The findings suggest that technology integration becomes meaningful when it is connected to pedagogical objectives and learners' needs rather than merely focused on the use of digital tools. Therefore, digital professional development should emphasize the integration of technological, pedagogical, and content knowledge. At the same time, unequal infrastructure and access to professional learning opportunities indicate that digital transformation requires institutional and policy-level support. This finding also explains the divergent outcomes reported across studies: digital competence may strengthen professional practice, but its effectiveness is conditioned by pedagogical preparation and the availability of institutional support.

The findings regarding Continuous Professional Development indicate that sustainable teacher professionalism cannot be achieved through short-term training programmes alone. Long-term professional learning ecosystems involving mentoring, coaching, professional learning communities, peer observation, action research, and reflective practice are more consistent with the continuous nature of professional growth. This implies that CPD should be integrated into teachers' everyday professional practice rather than treated as an occasional activity separate from classroom instruction. The contrast between short-term training and sustained professional learning further suggests that the continuity and relevance of CPD are more important than participation alone.

Educational leadership and institutional support further influence whether teachers are able to apply and sustain the competencies developed through professional learning. The findings suggest that school leaders should function not only as administrative managers but also as instructional leaders who create conditions for collaboration, innovation, and continuous improvement. Similarly, adequate infrastructure, funding, supervision, and access to professional learning opportunities are necessary to ensure that individual teacher commitment can be transformed into sustainable professional practice.

Beyond synthesizing recent empirical evidence, this review contributes conceptually by proposing an integrated framework that positions teacher professionalism as a dynamic system shaped by the interaction of individual competencies, organizational support, and educational policy. Regarding geographical scope, this review primarily focuses on Indonesian primary education, while international studies were included to provide comparative perspectives. The international evidence broadly supports the importance of digital competence, continuous professional development, and institutional support, while Indonesian studies provide context-specific insights into the implementation of these dimensions within the national education system. Therefore, international literature is interpreted as contextual and comparative evidence rather than as direct evidence of conditions in Indonesian primary education. The identified findings also reveal that strengthening teacher professionalism should move beyond short-term training programmes toward sustainable professional learning systems that encourage collaboration, lifelong learning, and evidence-based instructional improvement. Consequently, the proposed framework provides a valuable reference for future research while offering practical guidance for policymakers, school leaders, and teacher education institutions in designing comprehensive strategies to improve the quality of primary education in Indonesia.

CONCLUSION

The findings of this systematic literature review indicate that teacher professionalism in Indonesian primary education during the digital era is associated with several interconnected dimensions, including professional competence, digital competence, continuous professional development, educational leadership, and institutional support. Across the reviewed studies, professional competence was associated with pedagogical knowledge, reflective practice, and adaptability, while digital competence was linked to teachers' capacity to integrate technology into learning. The reviewed evidence further indicates that continuous professional development, supportive leadership, and adequate institutional conditions

contribute to teacher professional growth. These findings are directly synthesized from the evidence reported in the reviewed literature.

Based on the synthesis of these findings, this review conceptually interprets teacher professionalism as an interconnected system rather than a set of independent competencies. The proposed framework positions professional and digital competence as core capacities, continuous professional development as a mechanism for their ongoing development, and educational leadership and institutional support as enabling conditions for sustainable professional practice. This framework represents the authors' conceptual interpretation of the reviewed evidence and was not directly tested as an empirical model in the included studies.

Practically, schools should strengthen teacher professionalism through sustained mentoring, peer collaboration, coaching, reflective practice, and relevant digital professional development rather than relying solely on short-term training. School leaders should provide time, resources, and instructional supervision to support teachers' continuous learning, while education authorities should improve equitable access to digital infrastructure and context-relevant professional development, particularly in schools with limited resources. Teacher education institutions should also integrate digital pedagogy and reflective practice into teacher preparation and professional development program. Overall, strengthening teacher professionalism requires alignment between individual teacher competencies and the institutional conditions that support their continuous development, providing a basis for future empirical research on sustainable professional learning in Indonesian primary education.

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0016

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