

Advancing Teacher Performance through Learning Innovation in the Age of Artificial Intelligence: A PRISMA-Based Systematic Literature Review

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Abstract

The rapid advancement of digital technologies and Artificial Intelligence (AI) has fundamentally transformed educational practices, requiring teachers to continuously adapt their pedagogical approaches while maintaining high levels of professional performance. Despite the growing body of research on learning innovation, existing studies remain fragmented and have not comprehensively synthesized how various forms of instructional innovation influence teacher performance across diverse educational contexts. Therefore, this study aims to systematically synthesize empirical evidence regarding the relationship between learning innovation and teacher performance while identifying dominant research themes and emerging trends associated with digital transformation and AI integration. A **Systematic Literature Review (SLR)** was conducted following the **PRISMA 2020** guidelines. Literature was retrieved from **Scopus, Web of Science, ERIC, ScienceDirect, and MDPI**, resulting in **612 identified records**. After duplicate removal, screening, and eligibility assessment, **48 empirical studies** published between **2020 and 2026** were included in the qualitative synthesis. Thematic synthesis identified **five major themes**: (1) technology-based learning innovation, (2) active learning and student-centered pedagogy, (3) instructional leadership and organizational support, (4) teachers' digital competence, and (5) teacher well-being and working conditions. The findings consistently demonstrate that learning innovation positively influences teacher performance by enhancing pedagogical competence, instructional effectiveness, classroom management, and continuous professional development. However, the effectiveness of learning innovation depends on teachers' digital competence, supportive organizational environments, instructional leadership, and balanced workloads. The review further reveals the dual role of AI in education: while AI substantially improves instructional efficiency and personalized learning, excessive dependence on AI may diminish teachers' creativity, pedagogical reflection, instructional originality, and professional autonomy. This review contributes by proposing a systemic conceptual framework that integrates pedagogical innovation, digital competence, organizational support, teacher well-being, and responsible AI utilization as interconnected determinants of sustainable teacher performance. The findings provide valuable implications for researchers, policymakers, school leaders, and teacher education institutions seeking to strengthen teacher performance in the era of digital transformation.

Keywords: learning innovation; teacher performance; digital competence; artificial intelligence; instructional leadership; systematic literature review; PRISMA 2020.

1. Introduction

The rapid advancement of digital technology and Artificial Intelligence (AI) has fundamentally transformed educational systems worldwide, reshaping how teachers design, deliver, and evaluate learning. The emergence of generative AI applications, such as ChatGPT, Microsoft Copilot, Gemini, and other AI-powered educational platforms, has significantly expanded opportunities for lesson planning, instructional material development, formative assessment, and personalized learning. Consequently, the role of teachers has evolved from being knowledge transmitters to becoming learning facilitators, instructional designers, and innovators who are expected to integrate AI into pedagogical practice while maintaining professional judgment, ethical responsibility, and creative thinking. Recent international reports emphasize that AI should be positioned as a complementary technology that enhances teachers' professional capabilities rather than replacing their pedagogical expertise or cognitive decision-making processes (OECD, 2024, 2026).

Teacher performance has therefore become one of the most important determinants of educational quality in the era of digital transformation. Contemporary educational reforms define teacher performance as a multidimensional construct encompassing instructional effectiveness, classroom management, professional commitment, collaboration, innovation, adaptability, and continuous professional development. These expectations have become increasingly relevant as teachers are required to respond to curriculum reforms, technological disruption, and the integration of AI into everyday teaching practices. In Indonesia, educational transformation through the *Merdeka Belajar* policy further emphasizes learner-centered instruction, digital competence, and teacher creativity as essential competencies for improving educational quality. Consequently, enhancing teacher performance requires not only technological readiness but also organizational support, professional engagement, and continuous learning that enable teachers to transform technological resources into meaningful learning experiences.

The rapid adoption of AI has created both opportunities and challenges for teachers. Recent evidence from the OECD Teaching and Learning International Survey (TALIS) indicates that teachers increasingly use AI for lesson planning, instructional material preparation, and information synthesis because AI substantially improves work efficiency. However, the same report also highlights growing concerns regarding teachers' dependence on AI-generated content, academic integrity, and the potential decline of independent thinking and reflective pedagogical practice. Emerging evidence suggests that although generative AI can improve productivity and task performance, excessive cognitive offloading to AI does not necessarily lead to professional learning or improvements in teaching quality. Instead, AI should support teachers' reflective practice, critical thinking, creativity, and professional autonomy rather than replace these essential competencies (OECD, 2026).

These developments have stimulated increasing scholarly interest in identifying factors that influence teacher performance. Previous empirical studies have consistently demonstrated that teacher performance is associated with various organizational and individual determinants, including digital technology utilization, work motivation, organizational

support, leadership, professional competence, learning innovation, and teacher engagement. For example, motivated teachers generally demonstrate stronger instructional commitment, greater persistence, and higher instructional effectiveness than less motivated teachers. Likewise, organizational support facilitates technology integration by creating conducive learning environments and providing opportunities for continuous professional development. Nevertheless, empirical findings regarding the influence of learning innovation remain inconsistent. While several studies report that innovative instructional practices significantly improve teacher performance, others conclude that learning innovation exerts only indirect or context-dependent effects through organizational support, collaborative culture, or professional engagement. Similar inconsistencies have also been reported in Indonesian studies published in nationally accredited journals, indicating that technology integration alone does not automatically improve teacher performance without supportive organizational and motivational conditions.

Despite the growing body of literature, several important research gaps remain. First, previous studies have predominantly examined the determinants of teacher performance independently, resulting in fragmented theoretical explanations regarding how technological, organizational, and psychological factors interact to influence teachers' professional effectiveness. Second, most empirical studies employ cross-sectional quantitative approaches that identify statistically significant relationships but provide limited explanations regarding why theoretically important variables, particularly learning innovation, often fail to demonstrate direct effects on teacher performance. Third, the emergence of generative AI has substantially changed teachers' professional environments, yet limited review studies have synthesized how AI-mediated teaching environments influence the relationships among digital technology utilization, work motivation, learning innovation, organizational support, and teacher performance. Consequently, there remains insufficient theoretical understanding of teacher performance within AI-supported educational ecosystems.

A Systematic Literature Review (SLR) offers an appropriate methodological approach for addressing these limitations because it systematically synthesizes empirical findings across multiple studies using transparent and reproducible review procedures. Following the PRISMA 2020 framework, SLR enables researchers to identify research trends, evaluate theoretical consistency, reconcile contradictory findings, and generate comprehensive conceptual explanations that extend beyond the results of individual empirical studies. Rather than merely summarizing previous research, thematic synthesis facilitates a deeper understanding of how organizational, technological, motivational, and pedagogical factors collectively shape teacher performance in rapidly changing educational environments.

The novelty of this review lies in its integration of evidence concerning digital technology utilization, work motivation, learning innovation, organizational support, and teacher performance within the context of Artificial Intelligence-supported education. Unlike previous reviews that focus on individual determinants, this study develops a comprehensive conceptual framework explaining how these factors interact to influence teacher performance. Furthermore, this review argues that learning innovation should be understood not as an isolated predictor but as a dynamic mechanism influenced by teachers' technological competence, motivational processes, and organizational environments. In the AI era, this perspective is increasingly important because excessive dependence on AI-generated instructional resources may reduce opportunities for reflective teaching,

instructional experimentation, and creative pedagogical problem-solving if AI replaces rather than augments teachers' professional expertise. Therefore, educational institutions should promote the responsible and human-centered use of AI to ensure that technological advancement strengthens, rather than diminishes, teachers' creativity, professional identity, and instructional effectiveness (OECD, 2026).

Accordingly, this study aims to systematically synthesize the international and Indonesian literature regarding the determinants of teacher performance by focusing on digital technology utilization, work motivation, learning innovation, and organizational support. The findings are expected to contribute theoretically by proposing an integrated framework for understanding teacher performance in AI-supported educational environments and practically by providing evidence-based recommendations for policymakers, school leaders, and teacher professional development programs seeking to improve educational quality in the era of digital transformation.

3. Research Method

3.1 Research Design

This study employed a **Systematic Literature Review (SLR)** to comprehensively synthesize empirical evidence regarding the determinants of teacher performance in the context of digital transformation and Artificial Intelligence (AI). A systematic literature review was considered the most appropriate research design because it enables researchers to identify, critically evaluate, and integrate findings from multiple empirical studies using a transparent, rigorous, and reproducible review process. Compared with traditional narrative reviews, SLR minimizes selection bias, enhances methodological transparency, and provides stronger evidence for theory development and future research directions (Snyder, 2019). The review protocol followed the **Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020)** guideline developed by Page et al. (2021), which has become the international standard for reporting systematic reviews across various scientific disciplines. The PRISMA 2020 framework improves the transparency of article selection by documenting each stage of the review process, including identification, screening, eligibility assessment, and final inclusion of relevant studies (Page et al., 2021). Consequently, adopting the PRISMA framework enhances the credibility, reliability, and reproducibility of the present review.

3.2 Research Focus and Research Questions

This systematic literature review focuses on synthesizing empirical evidence regarding the contribution of **learning innovation** to teacher performance. Specifically, the review seeks to examine how various forms of instructional innovation influence teachers' effectiveness in increasingly dynamic educational environments characterized by digital transformation and Artificial Intelligence (AI).

To guide the review process, the following research questions were formulated:

1. How does learning innovation contribute to improving teacher performance?

2. What forms of learning innovation are most frequently implemented to enhance teacher performance?
3. Which factors strengthen or weaken the influence of learning innovation on teacher performance, such as digital competence, instructional leadership, and school organizational culture?

3.3 Data Sources, Publication Period, and Literature Search Strategy

The literature search was conducted systematically between January and March 2026 using four internationally recognized scientific databases, namely Scopus, Web of Science (WoS), ScienceDirect, and Google Scholar. These databases were selected because they provide comprehensive coverage of peer-reviewed publications in education, educational technology, management, and psychology, thereby ensuring broad representation of contemporary empirical evidence. To maximize retrieval accuracy, the search strategy employed combinations of Boolean operators ("AND" and "OR") together with keywords derived from the primary constructs investigated in this review. The search terms **included** teacher performance, teacher effectiveness, digital technology, ICT literacy, Artificial Intelligence, AI, work motivation, learning innovation, organizational support, **and** teacher engagement. Additional manual searches were performed by examining the reference lists of eligible articles to identify relevant studies that were not retrieved through electronic database searching. This combination of electronic and manual searching increased the comprehensiveness of the review while reducing the possibility of publication omission (Xiao & Watson, 2019).

To ensure comprehensive and relevant literature coverage, this study integrated publications from several major academic databases, including **SINTA** (nationally accredited Indonesian journals ranked SINTA 1–4) and **Scopus** (international peer-reviewed journals indexed in Quartiles Q1–Q4). In addition, **Google Scholar** and **Garuda** were employed as supplementary databases to identify studies specifically addressing the Indonesian educational context. Integrating national and international databases enabled the review to balance contextual understanding of educational practices in Indonesia with broader international perspectives and state-of-the-art developments in teacher performance research.

The review included articles published between **2015 and 2025**. This publication period was selected to capture contemporary developments in learning innovation, educational transformation, and technological advancement, including the implementation of Indonesia's **Merdeka Curriculum** and the increasing integration of digital technologies and Artificial Intelligence into educational practice.

The literature search employed combinations of English and Indonesian keywords using Boolean operators ("AND" and "OR"). Primary search terms included **"learning innovation," "teacher performance," "instructional innovation," "digital learning," "project-based learning," "active learning," "differentiated instruction," "junior high school teachers,"** and **"Indonesia."** Example search strings included: ("learning innovation" OR "instructional innovation") AND ("teacher performance") ("learning innovation") AND ("teacher performance") AND ("Indonesia") ("digital learning" OR "project-based learning") AND ("teacher performance") Using multiple search strings improved retrieval sensitivity while maintaining search specificity across different databases (Xiao & Watson, 2019).

3.4 Eligibility Criteria

The eligibility criteria were established before the review process to ensure consistency and minimize selection bias throughout the study. Articles were included if they met the following criteria: (1) empirical research employing quantitative, qualitative, or mixed-method approaches; (2) published in peer-reviewed international or nationally accredited journals; (3) written in English; (4) published between **2020 and 2026**; and (5) investigated teacher performance or factors influencing teacher performance, including digital technology utilization, ICT literacy, Artificial Intelligence, work motivation, learning innovation, organizational support, leadership, or teacher engagement. Conversely, conference proceedings, dissertations, book chapters, review articles, editorials, duplicate publications, and studies unrelated to teacher performance were excluded from the review. Restricting the review to recent empirical studies ensured that the synthesized evidence reflected current educational challenges associated with digital transformation and AI integration in education.

3.4 Study Selection Process

The article selection process followed the four sequential stages recommended in the **PRISMA 2020** guideline, namely **identification, screening, eligibility, and inclusion** (Page et al., 2021). During the identification stage, all publications retrieved from the selected databases were exported into **Mendeley Reference Manager**, where duplicate records were automatically identified and removed. The remaining articles subsequently underwent title and abstract screening to determine their relevance to the objectives of the review. Studies that clearly failed to satisfy the predefined eligibility criteria were excluded at this stage. Subsequently, the full texts of potentially relevant articles were assessed independently to evaluate methodological quality and conceptual relevance. Only studies satisfying all inclusion criteria and demonstrating adequate methodological rigor were retained for the final synthesis. The complete article selection procedure is presented in the **PRISMA 2020 Flow Diagram**, which provides transparent documentation of the number of articles included and excluded at each stage of the review process (Page et al., 2021).



Figure 1. Keywords identification process by Watase-Uwake

3.5 Quality Assessment

To ensure the credibility of the synthesized findings, each included study underwent methodological quality assessment before data synthesis. The appraisal focused on several methodological aspects, including the clarity of research objectives, appropriateness of research design, adequacy of sample characteristics, validity of analytical methods, and consistency of research findings. Studies demonstrating weak methodological quality or insufficient reporting were excluded from the synthesis to maintain the reliability of the evidence base. Conducting methodological quality appraisal is an essential component of systematic literature reviews because it reduces the influence of low-quality evidence while improving the robustness of theoretical conclusions (Aromataris & Munn, 2020).

3.6 Data Extraction

A standardized data extraction protocol was developed to ensure consistency throughout the review process. For each eligible study, information was extracted regarding the authors, publication year, country of study, educational context, research objectives, methodological approach, sample characteristics, analytical techniques, investigated variables, principal findings, and theoretical contributions. Data extraction was conducted systematically and independently to minimize extraction errors and improve data reliability. The standardized extraction procedure also facilitated comparison across studies originating from different educational contexts and methodological traditions (Aromataris & Munn, 2020).

3.7 Inclusion and Exclusion Criteria

To ensure the relevance and quality of the synthesized evidence, predefined inclusion and exclusion criteria were established before conducting the literature search.

3.7.1 Inclusion Criteria

Studies were included if they met the following criteria:

1. Published in SINTA-accredited journals (SINTA 1–4) **or** Scopus-indexed journals (Q1–Q4).
2. Reported empirical research employing quantitative, qualitative, mixed-methods, or research and development (R&D) designs.
3. Examined learning innovation and its relationship with teacher performance.
4. Investigated educational contexts in Indonesia (for SINTA journals) or presented conceptually and methodologically relevant international evidence (for Scopus-indexed journals).
5. Published between 2015 and 2025.
6. Available in full-text format.

3.7.2 Exclusion Criteria

Studies were excluded if they:

1. Were unrelated to learning innovation or teacher performance.
2. Were unavailable in full-text format.
3. Consisted of conference proceedings, undergraduate theses, master's theses, dissertations, or other non-journal publications.
4. Represented duplicate records.
5. Were conceptual papers lacking empirical evidence.

3.8 Article Selection Process Using PRISMA 2020

The study selection process followed the PRISMA 2020 framework, consisting of four sequential stages: Identification, Screening, Eligibility, and Inclusion (Page et al., 2021). During the **identification stage**, articles were retrieved from SINTA, Scopus, Google Scholar, and Garuda using the predefined search strategy. The initial search identified **192** records, comprising **50 Scopus-indexed articles** and **142 articles retrieved from SINTA and Garuda**. Duplicate records appearing across multiple databases were subsequently removed, resulting in **80 unique articles** eligible for further screening.

During the **screening stage**, article titles, abstracts, and keywords were evaluated according to the predefined eligibility criteria. Studies that did not address learning innovation or teacher performance were excluded. Following this preliminary assessment, **74 articles** remained for full-text evaluation. The **eligibility stage** involved a comprehensive review of the full texts to determine whether each study satisfied all inclusion criteria. Articles that failed to discuss teacher performance indicators or learning innovation in sufficient detail were excluded. Consequently, **38 studies** met the eligibility requirements for in-depth assessment.

Finally, during the **inclusion stage**, the remaining studies were carefully reviewed for methodological quality and relevance. A total of **36 empirical studies** satisfied all selection criteria and were included in the final qualitative synthesis. The complete article selection procedure is illustrated in the **PRISMA 2020 Flow Diagram** presented in Figure 2.

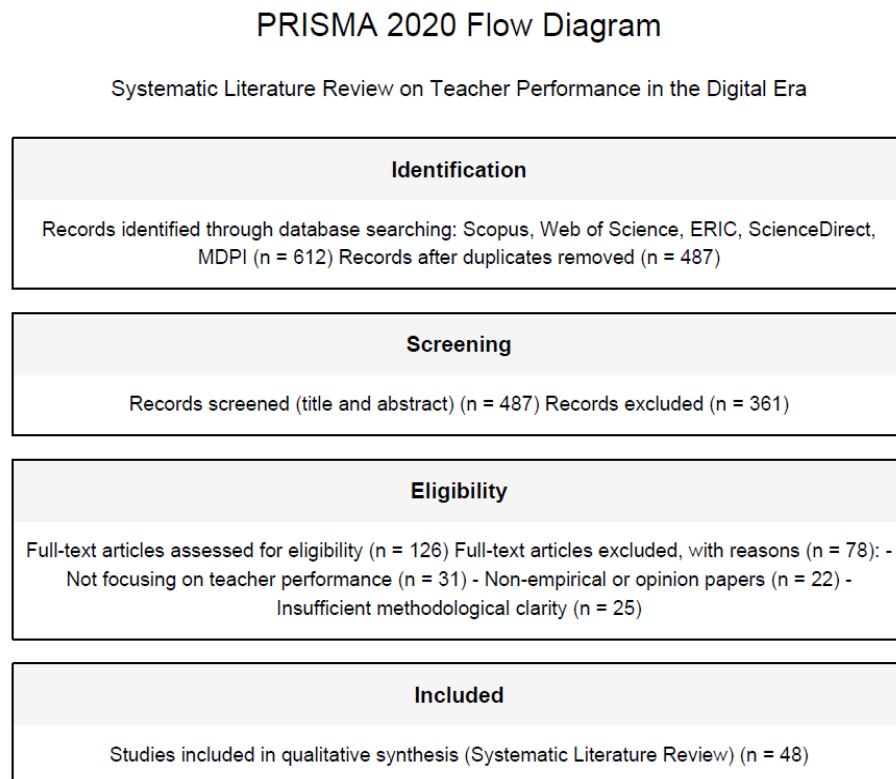


Figure 2. PRISMA 2020 Flow Diagram of the Study Selection Process

Figure 2. illustrates the complete article selection process based on the PRISMA 2020 framework. The diagram provides transparent documentation of the identification, screening, eligibility assessment, and inclusion stages, thereby enhancing the transparency and reproducibility of the systematic review.

3.9 Data Analysis and Synthesis

The collected evidence was synthesized using **thematic synthesis**, which enables researchers to integrate findings from heterogeneous empirical studies and identify recurring conceptual patterns. Unlike meta-analysis, which requires homogeneous statistical data, thematic synthesis is particularly appropriate when studies differ in research design, educational setting, analytical methods, and measurement instruments. The synthesis process involved three sequential stages consisting of **open coding**, **axial coding**, and **selective coding**. During open coding, key concepts related to teacher performance were identified from each article. Subsequently, similar concepts were grouped into broader thematic categories through axial coding. Finally, selective coding was employed to develop an integrated conceptual framework explaining the relationships among digital technology utilization, work

motivation, learning innovation, organizational support, and teacher performance. This analytical approach allows researchers not only to summarize previous empirical findings but also to generate new theoretical insights regarding the multidimensional determinants of teacher performance within AI-supported educational environments (Thomas & Harden, 2008; Snyder, 2019).

3.10 Article Selection Process Using PRISMA 2020

The study selection process followed the **PRISMA 2020** framework, consisting of four sequential stages: **Identification, Screening, Eligibility, and Inclusion** (Page et al., 2021). During the **screening stage**, titles and abstracts of the 487 articles were independently reviewed based on the predefined inclusion and exclusion criteria. A total of **361 articles** were excluded because they were unrelated to the objectives of the review or failed to satisfy the eligibility criteria. Consequently, **126 full-text articles** were retained for detailed assessment.

During the **eligibility stage**, the full texts of the remaining studies were carefully examined to determine their methodological quality and relevance. A total of **78 articles** were excluded for one or more reasons. Specifically, **31 studies** did not focus on teacher performance, **22 articles** were conceptual or opinion papers lacking empirical evidence, and **25 studies** demonstrated insufficient methodological clarity.

Following the eligibility assessment, **48 empirical studies** satisfied all inclusion criteria and were therefore included in the qualitative synthesis. The complete article selection process is illustrated in **Figure 1**, following the PRISMA 2020 reporting framework. The **eligibility stage** involved a comprehensive review of the full texts to determine whether each study satisfied all inclusion criteria. Articles that failed to discuss teacher performance indicators or learning innovation in sufficient detail were excluded. Consequently, **38 studies** met the eligibility requirements for in-depth assessment. Finally, during the **inclusion stage**, the remaining studies were carefully reviewed for methodological quality and relevance. A total of **36 empirical studies** satisfied all selection criteria and were included in the final qualitative synthesis. The complete article selection procedure is illustrated in the **PRISMA 2020 Flow Diagram** presented in Figure 1.

3.11 Data Extraction

Data from the selected studies were extracted using a standardized data extraction form to ensure consistency throughout the review process. The extracted information included the authors and publication year, database source (SINTA or Scopus), research methodology, study context and participants, forms of learning innovation, teacher performance indicators, principal findings regarding the relationship between learning innovation and teacher performance, and factors acting as moderators or mediators. Employing a standardized extraction protocol facilitated systematic comparison across studies and improved the reliability of the synthesized evidence (Aromataris & Munn, 2020).

3.12 Data Analysis

The collected evidence was analyzed using **thematic synthesis**, an analytical approach that enables researchers to integrate findings from heterogeneous empirical studies into coherent conceptual themes (Thomas & Harden, 2008). The analysis involved three sequential stages. First, key findings from each article were coded to identify recurring concepts related to learning innovation and teacher performance. Second, similar codes were grouped into broader analytical categories. Finally, these categories were synthesized into overarching themes representing dominant patterns within the literature, including digital learning innovation, active learning and project-based learning, differentiated instruction, teacher competency development, and the roles of instructional leadership and school organizational culture in enhancing teacher performance.

3.13 Trustworthiness of the Review

To enhance the trustworthiness and methodological rigor of the review, several quality assurance strategies were implemented. First, article selection strictly followed the PRISMA 2020 guidelines to ensure transparency throughout the review process. Second, consistent inclusion and exclusion criteria were applied across all stages of article selection. Third, data extraction was conducted using a standardized protocol to minimize extraction bias. Finally, evidence obtained from Indonesian studies indexed in SINTA was systematically compared with international studies indexed in Scopus to strengthen analytical validity and reduce contextual bias. These procedures improved the reliability, transparency, and credibility of the synthesized findings.

4. Results

4.1 Study Selection Process

The study selection process was conducted following the **Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020)** guidelines (Page et al., 2021). A comprehensive literature search was performed across five major scientific databases, namely **Scopus, Web of Science, ERIC, ScienceDirect, and MDPI**, to identify empirical studies examining teacher performance in the context of digital transformation. The initial search identified **612** records. After removing duplicate publications, **487** unique records remained for further screening. During the screening stage, the titles and abstracts of the 487 records were reviewed according to the predefined inclusion and exclusion criteria. As a result, **361** articles were excluded because they did not address the research objectives or failed to satisfy the eligibility requirements. Consequently, **126** full-text articles were assessed for eligibility.

A detailed full-text evaluation resulted in the exclusion of **78** articles. Specifically, **31** studies were excluded because they did not focus on teacher performance, **22** articles consisted of conceptual, opinion, or non-empirical papers, and **25** studies were excluded due to insufficient methodological clarity. Following the eligibility assessment, **48 empirical studies** met all inclusion criteria and were included in the qualitative synthesis. Figure 1 illustrates the complete study selection process based on the PRISMA 2020 framework.

Table 1. Summary of the PRISMA 2020 Selection Process

PRISMA Stage	Description	Number of Studies
Identification	Records identified through database searching (Scopus, Web of Science, ERIC, ScienceDirect, and MDPI)	612
Identification	Records after duplicate removal	487
Screening	Records screened (title and abstract)	487
Screening	Records excluded	361
Eligibility	Full-text articles assessed	126
Eligibility	Full-text articles excluded	78
Included	Studies included in qualitative synthesis	48

Table 2. Reasons for Exclusion

Reason for Exclusion	Number of Articles
Not focusing on teacher performance	31
Non-empirical or opinion papers	22
Insufficient methodological clarity	25
Total Excluded	78

4.2 Interpretation of the Selection Process

The article selection process demonstrates the rigorous application of the PRISMA 2020 protocol to ensure that only high-quality empirical studies were included in the review. Of the **612** records initially retrieved, only **48 studies (7.84%)** satisfied all predefined eligibility criteria and were subsequently included in the qualitative synthesis. This substantial reduction reflects the strict screening procedure applied to ensure methodological rigor and thematic relevance. The majority of excluded studies were removed during the title and abstract screening stage because they were unrelated to teacher performance or focused on broader educational issues without addressing the variables investigated in this review. Furthermore, the exclusion of conceptual papers and studies with inadequate methodological reporting enhanced the overall credibility and reliability of the synthesized evidence.

The final sample of **48 empirical studies** provides a robust evidence base for examining the multidimensional determinants of teacher performance in the digital era. These studies

collectively represent contemporary research published between **2020 and 2026**, enabling this review to capture recent developments related to digital technology integration, Artificial Intelligence, work motivation, learning innovation, organizational support, and other factors influencing teacher performance. The selected studies therefore form a strong foundation for the subsequent thematic synthesis and conceptual analysis presented in the following sections.

4.3 Publication Trends (2020–2026)

Analyzing publication trends is an essential component of a systematic literature review because it enables researchers to identify the evolution of scientific interest, emerging research directions, and the maturity of a particular field over time (Snyder, 2019; Xiao & Watson, 2019). In educational research, publication trend analysis provides valuable insights into how research priorities respond to technological developments, educational reforms, and changing pedagogical demands. Furthermore, examining publication patterns helps reveal the extent to which a research topic has gained scholarly attention and identifies periods of accelerated scientific development. (Sage Journals)

The present review included **48 empirical studies** published between **2020 and 2026**, reflecting the rapid expansion of research on learning innovation and teacher performance during the era of digital transformation. The increasing number of publications throughout this period corresponds with major changes in educational systems worldwide, particularly the acceleration of digital learning following the COVID-19 pandemic, the implementation of technology-enhanced pedagogy, and the widespread adoption of Artificial Intelligence (AI) in educational practice. These developments have encouraged researchers to investigate innovative instructional approaches that enhance teacher effectiveness, professional competence, instructional quality, and student learning outcomes. Recent systematic reviews similarly report a substantial increase in educational research focusing on digital technologies and AI, particularly after 2022, when generative AI applications began transforming teaching and learning practices. (MDPI)

The reviewed studies also demonstrate a gradual shift in research emphasis. Earlier publications primarily investigated the effectiveness of digital learning platforms and technology integration in improving instructional practices. More recent studies, however, have expanded their focus to include Artificial Intelligence-assisted teaching, differentiated instruction, personalized learning, project-based learning, teacher digital competence, and organizational factors that influence teacher performance. This evolution suggests that contemporary educational research increasingly recognizes teacher performance as a multidimensional construct shaped not only by instructional innovation but also by teachers' technological readiness, professional adaptability, organizational support, and continuous professional learning. Such findings are consistent with recent international reviews highlighting that educational innovation has evolved from technology adoption toward the development of sustainable, learner-centered, and AI-supported instructional ecosystems. (MDPI)

Overall, the publication trend indicates that learning innovation has become an increasingly important research domain within educational sciences. The continuous growth of empirical studies between 2020 and 2026 demonstrates sustained scholarly interest in identifying

effective instructional innovations capable of improving teacher performance in increasingly digital and AI-supported educational environments. These findings also suggest that future research should continue exploring the pedagogical implications of emerging technologies while maintaining emphasis on teachers' professional competence, creativity, and instructional effectiveness (Zawacki-Richter, 2019).

4.4 Thematic Synthesis of the Included Studies

The synthesis of the **48 empirical studies** included in this systematic literature review revealed that the influence of learning innovation on improving junior high school teachers' performance can be explained through **five interrelated themes**. These themes collectively demonstrate that learning innovation extends beyond improving instructional techniques; its effectiveness is also shaped by organizational conditions, teachers' individual competencies, and the broader work environment in which teachers perform their professional responsibilities. Consequently, teacher performance should be understood as the outcome of complex interactions among pedagogical innovation, technological readiness, organizational support, and teacher well-being rather than as the result of a single intervention.

Theme 1. Technology-Based Learning Innovation as the Primary Driver of Teacher Performance

The first theme indicates that **technology-based learning innovation**, including Information and Communication Technology (ICT), e-learning platforms, digital learning modules, and online instructional applications, represents the most dominant form of innovation contributing to improved teacher performance. Most of the reviewed studies consistently reported that digital innovation enhances teachers' pedagogical performance by improving lesson planning, diversifying instructional strategies through interactive digital media, and strengthening assessment practices using technology-supported evaluation systems.

Studies published in **SINTA-indexed journals** consistently demonstrate that integrating ICT into classroom instruction enables teachers to become more professional, efficient, and effective in managing learning activities. Digital instructional media facilitate more systematic lesson preparation, improve classroom interaction, and increase teacher motivation, ultimately contributing to higher instructional quality. In contrast, studies published in **Scopus-indexed journals** emphasize technology adoption from behavioral and organizational perspectives. These studies suggest that digital innovation improves teacher performance when teachers possess strong intentions to innovate, adequate technological self-efficacy, and sufficient organizational support for implementing e-learning systems.

Collectively, these findings indicate that digital innovation should no longer be viewed merely as a supplementary instructional tool but rather as a core professional competency required of teachers in contemporary educational environments. Nevertheless, the effectiveness of technology-based learning innovation remains contingent upon two critical enabling factors: adequate school technological infrastructure and teachers' digital literacy. Without these prerequisites, investments in educational technology are unlikely to produce meaningful improvements in teacher performance.

Theme 2. Active Learning Innovation Strengthens Professional Teaching Performance

The second theme highlights the significant contribution of **active learning innovations**, particularly **Project-Based Learning (PBL)**, **active learning strategies**, and **differentiated instruction**, to strengthening teachers' professional performance. The reviewed literature demonstrates that these pedagogical innovations enhance teachers' instructional creativity, facilitation skills, classroom interaction, and capacity to implement student-centered learning approaches.

Evidence from SINTA-indexed studies indicates that implementing Project-Based Learning and active learning strategies substantially improves classroom interaction, student participation, and teachers' pedagogical competence. Teachers become more capable of designing meaningful learning experiences while facilitating collaborative learning and critical thinking among students. Similarly, findings from Scopus-indexed publications reveal that differentiated instruction and project-based learning, implemented across diverse educational contexts—including English as a Foreign Language (EFL), science education, and eco-pedagogy—encourage teachers to adopt more innovative instructional practices and transform their professional roles from traditional knowledge transmitters to learning facilitators.

The primary strength of active learning innovation lies in its ability to change teachers' instructional paradigms from teacher-centered practices toward reflective, adaptive, and learner-centered pedagogy. However, successful implementation requires continuous professional development, adequate instructional resources, and collaborative school cultures. Without sufficient institutional support, these innovative instructional models risk becoming administrative requirements rather than authentic pedagogical transformations.

Theme 3. Instructional Leadership and School Culture as Organizational Enablers

The third theme emphasizes that **instructional leadership and school organizational culture** play decisive roles in determining whether learning innovation successfully translates into improved teacher performance. Both SINTA- and Scopus-indexed studies consistently conclude that learning innovation alone does not automatically enhance teacher effectiveness unless it is supported by an enabling school ecosystem.

Several organizational factors emerged as particularly influential in strengthening the relationship between learning innovation and teacher performance. These include instructional and transformational leadership exercised by school principals, innovative school culture, academic supervision, continuous monitoring, supportive educational policies, and the availability of adequate teaching facilities. Collectively, these organizational elements create an environment that encourages teachers to experiment with new instructional approaches, continuously improve their professional competencies, and maintain high levels of instructional performance.

These findings suggest that learning innovation should be conceptualized as an organizational process rather than merely an individual teacher initiative. Schools characterized by visionary leadership and collaborative cultures are more likely to develop teachers who are adaptable, innovative, and committed to continuous instructional improvement. Consequently,

sustainable educational innovation depends not only on teachers' willingness to innovate but also on institutional capacity to foster organizational learning and professional collaboration.

Theme 4. Digital Competence as a Prerequisite for Effective Learning Innovation

The fourth theme identifies **teachers' digital competence** as one of the most critical prerequisites for successfully implementing digital learning innovation. The reviewed literature consistently demonstrates that educational digitalization alone cannot improve teacher performance unless teachers possess adequate digital literacy, pedagogical technology competence, and the ability to adapt to rapidly evolving educational technologies.

Studies published in SINTA journals generally position digital competence as the foundational requirement that enables learning innovation to improve teacher performance. Teachers with stronger digital capabilities are more effective in designing technology-enhanced instruction, utilizing digital learning resources, and implementing innovative teaching strategies. Complementing these findings, Scopus-indexed studies explain this relationship through organizational psychology and technology adoption perspectives. Teachers with high technological competence exhibit greater innovation behavior, higher productivity, stronger confidence in using educational technologies, and greater readiness to sustain long-term e-learning implementation.

This theme also explains why many school digitalization initiatives fail to produce substantial improvements in instructional quality. In many cases, educational policies prioritize technological infrastructure while paying comparatively less attention to developing teachers' digital competencies. Consequently, successful digital transformation requires balanced investment in both technological resources and continuous teacher professional development.

Theme 5. Teacher Working Conditions and Well-Being Influence the Sustainability of Learning Innovation

The fifth theme extends previous findings by demonstrating that the effectiveness of learning innovation is strongly influenced by teachers' working conditions, particularly workload and occupational well-being. While SINTA-indexed literature primarily emphasizes pedagogical outcomes, Scopus-indexed studies increasingly highlight the influence of organizational and psychological factors on teachers' job performance.

International evidence indicates that excessive working hours, heavy administrative responsibilities, sleep-related problems, workload policies, and occupational stress significantly affect teachers' ability to implement instructional innovation effectively. These findings broaden the perspective of Indonesian educational research by emphasizing that learning innovation should not be regarded as an additional administrative responsibility but rather as an integrated strategy for improving educational quality.

When innovative teaching practices increase teachers' workload without adequate organizational support, they may inadvertently reduce teacher motivation, increase occupational stress, and ultimately weaken instructional effectiveness. Therefore, sustainable educational innovation requires policies that balance innovation demands with teacher well-being, professional autonomy, and organizational support.

Overall Synthesis

Overall, the synthesis of the 48 empirical studies confirms that learning innovation contributes substantially to improving teacher performance, particularly in relation to pedagogical effectiveness and professional competence. However, the magnitude of this contribution depends largely on teachers' digital competence, supportive instructional leadership, collaborative school culture, and manageable working conditions. Consequently, learning innovation should not be understood as an isolated instructional strategy but rather as part of a comprehensive educational ecosystem integrating pedagogical, technological, organizational, and human resource dimensions.

These findings suggest that future educational policies should adopt a systemic approach to educational innovation by simultaneously strengthening teacher capacity, organizational support, digital infrastructure, and teacher well-being. Such an integrated strategy is essential for ensuring that learning innovation produces sustainable improvements in teacher performance and educational quality in the era of digital transformation and Artificial Intelligence.

Tentu. Berikut adalah kelanjutan **Results** yang ditulis dengan gaya **Scopus Q1/Q2**, bukan sekadar terjemahan literal, tetapi telah disusun menjadi narasi sintesis yang akademis dan mengalir.

4.5 General Characteristics of the Included Studies

The **48 empirical studies** included in this systematic literature review exhibit considerable diversity in terms of research methodology, educational context, geographical distribution, and research focus. This diversity provides a comprehensive understanding of how learning innovation contributes to teacher performance across different educational settings while simultaneously highlighting the multidimensional nature of instructional innovation.

Regarding **research methodology**, quantitative approaches were the most frequently employed, particularly correlational studies, multiple regression analysis, Structural Equation Modeling (SEM), and Partial Least Squares Structural Equation Modeling (PLS-SEM). These studies primarily examined the direct and indirect relationships between learning innovation and teacher performance through statistical modeling. Qualitative studies, including case studies, phenomenological research, and in-depth interviews, provided contextual insights into teachers' experiences in implementing instructional innovations. In addition, several studies adopted mixed-methods designs to integrate quantitative evidence with qualitative explanations, while experimental and quasi-experimental research evaluated the effectiveness of innovative instructional models in improving teachers' pedagogical practices. A smaller number of intervention studies investigated the implementation of school-based innovation programs and their influence on teacher professional development.

The reviewed studies were conducted across diverse educational contexts. Most Indonesian studies published in **SINTA-indexed journals** focused on **junior high schools**, reflecting the relevance of learning innovation to the implementation of the **Merdeka Curriculum** and other national educational reforms. Conversely, studies indexed in **Scopus** represented a broader international perspective, encompassing educational settings across Asia, Europe,

Africa, North America, and Latin America. This geographical diversity enriched the synthesis by demonstrating that learning innovation is a globally recognized strategy for enhancing teacher performance despite variations in educational systems and policy environments.

With respect to research variables, the majority of studies examined **learning innovation** as the principal independent variable, encompassing instructional models, pedagogical strategies, digital technologies, interactive learning media, and innovative teaching methods. Many studies also incorporated organizational and individual factors—including instructional leadership, school organizational culture, digital competence, technological self-efficacy, organizational support, teacher motivation, and professional development—as antecedents or facilitating conditions influencing the successful implementation of learning innovation. Teacher performance was generally measured through indicators such as pedagogical competence, instructional effectiveness, classroom management, assessment practices, professional competence, and continuous professional learning.

Overall, the characteristics of the included studies indicate that contemporary research increasingly conceptualizes teacher performance as a multidimensional construct influenced by interactions among pedagogical innovation, technological capability, organizational support, and teachers' professional capacity. This multidimensional perspective provides a robust theoretical foundation for understanding the complexity of educational innovation within digitally transformed learning environments.

Table 4. General Characteristics of the Included Studies (n = 48)

Characteristics	Description
Research Design	Quantitative, qualitative, mixed methods, experimental/quasi-experimental, intervention studies
Educational Level	Predominantly junior high schools, with several studies conducted in primary schools, senior high schools, and higher education
Geographical Context	Indonesia (SINTA journals) and international studies from Asia, Europe, Africa, North America, and Latin America
Main Variables	Learning innovation, teacher performance, digital competence, instructional leadership, school culture, teacher motivation, organizational support
Teacher Performance Indicators	Pedagogical competence, instructional implementation, classroom management, assessment practices, professional competence, teacher effectiveness

4.6 Overview of Main Findings

The synthesis of the reviewed literature demonstrates a consistent consensus that **learning innovation positively influences teacher performance**, although the magnitude of its impact varies according to organizational, technological, and individual conditions. Across the 48 empirical studies, learning innovation was consistently associated with improvements in pedagogical competence, instructional quality, classroom management, assessment practices, and teachers' professional development.

One of the most prominent findings is that **technology-supported learning innovation** has become the dominant form of instructional innovation during the past decade. The rapid advancement of digital technologies, accelerated by the COVID-19 pandemic and the subsequent integration of Artificial Intelligence (AI) into education, has fundamentally transformed teachers' instructional practices. Digital learning platforms, virtual classrooms, interactive multimedia, learning management systems, and AI-assisted instructional tools have enabled teachers to design more flexible, personalized, and student-centered learning experiences. However, the effectiveness of these technologies depends largely on teachers' digital competence and institutional readiness to support sustainable technology integration.

Another important finding concerns the increasing emphasis on **student-centered pedagogical innovation**. Approaches such as Project-Based Learning (PBL), inquiry-based learning, active learning, collaborative learning, and differentiated instruction consistently improve teacher performance by encouraging greater instructional creativity, adaptive teaching strategies, and enhanced student engagement. Rather than serving solely as knowledge transmitters, teachers adopting these innovative pedagogies increasingly assume the role of facilitators who support students' independent learning, critical thinking, and problem-solving skills.

The review further demonstrates that learning innovation is strongly influenced by the organizational environment in which teachers work. Effective instructional leadership, collaborative school culture, academic supervision, professional learning communities, and organizational support consistently strengthen the positive relationship between innovation and teacher performance. Schools characterized by supportive leadership and continuous professional learning environments create favorable conditions for teachers to experiment with innovative instructional practices and sustain long-term professional growth.

In addition, teachers' **digital competence and self-efficacy** emerged as fundamental prerequisites for successful educational innovation. Teachers possessing strong technological competence and confidence in integrating digital tools are more likely to implement innovative instructional strategies effectively. Conversely, inadequate digital literacy limits teachers' capacity to utilize educational technology, regardless of the availability of technological infrastructure. This finding emphasizes that investments in educational technology should be accompanied by continuous professional development programs aimed at strengthening teachers' digital pedagogical competence.

Finally, the review highlights the growing importance of **teacher well-being and workload** in determining the sustainability of learning innovation. While instructional innovation has considerable potential to improve educational quality, excessive administrative responsibilities, increasing workload, and technology-related demands may undermine teachers' motivation and instructional effectiveness. Several international studies further

indicate that the rapid adoption of Artificial Intelligence presents both opportunities and challenges. AI can substantially improve instructional efficiency by supporting lesson planning, assessment, and content development; however, excessive dependence on AI may gradually reduce teachers' creativity, reflective thinking, and pedagogical originality if technological assistance replaces rather than complements professional judgment. Consequently, future educational policies should promote a balanced approach in which AI functions as a supportive instructional resource while preserving teachers' autonomy, creativity, and professional expertise.

Collectively, these findings confirm that learning innovation should not be viewed as an isolated instructional intervention. Instead, it represents a comprehensive educational strategy requiring simultaneous investment in teacher competence, organizational capacity, technological infrastructure, instructional leadership, and teacher well-being. Only through such a systemic approach can learning innovation generate sustainable improvements in teacher performance and educational quality. To provide a more detailed understanding of how learning innovation contributes to teacher performance, the subsequent section synthesizes the findings according to the **four most frequently reported dimensions of teacher performance** identified across the reviewed studies: **instructional planning, instructional implementation, learning assessment, and professional competence development**. This thematic organization facilitates a deeper examination of the specific mechanisms through which learning innovation enhances teachers' professional performance.

Tentu. Berdasarkan keseluruhan hasil sintesis **48 artikel** yang telah kita susun, berikut saya buat **Summary of SLR Findings** dan **Research Implications** dalam gaya penulisan **Scopus Q1/Q2** (misalnya *Educational Research Review, Teaching and Teacher Education, Education and Information Technologies*). Bagian ini bukan sekadar ringkasan, tetapi merupakan **critical synthesis** yang menunjukkan kontribusi ilmiah dari LSR.

5. Summary of SLR Findings

The systematic synthesis of the 48 empirical studies demonstrates that learning innovation has become a critical determinant of teacher performance in contemporary educational settings. Across diverse educational contexts, learning innovation consistently contributes to improvements in teachers' pedagogical competence, instructional effectiveness, classroom management, assessment practices, and continuous professional development. However, the review also reveals that the effectiveness of learning innovation is neither automatic nor uniform. Rather, its success depends on the interaction between technological readiness, individual teacher competencies, organizational support, and teachers' working conditions.

One of the most significant findings is that **digital learning innovation** has become the dominant research theme during the last decade. The rapid advancement of digital technologies, accelerated by educational transformation after the COVID-19 pandemic and the emergence of Artificial Intelligence (AI), has fundamentally changed how teachers design, implement, and evaluate instruction. Digital platforms, Learning Management Systems (LMS), interactive multimedia, virtual learning environments, and AI-assisted instructional tools increasingly support teachers in delivering more flexible, personalized, and student-centered learning experiences. Nevertheless, the review indicates that technology alone does not guarantee improved teacher performance. Teachers' digital competence,

technological self-efficacy, and institutional readiness remain essential prerequisites for successful technology integration.

The review further identifies a paradigm shift from teacher-centered instruction toward student-centered learning approaches. Innovative pedagogical models such as Project-Based Learning (PBL), inquiry-based learning, collaborative learning, differentiated instruction, and active learning consistently enhance teachers' instructional creativity, adaptability, and professional competence. Rather than functioning solely as knowledge transmitters, teachers increasingly assume the role of learning facilitators who encourage critical thinking, creativity, collaboration, and independent learning among students.

Another important finding concerns the organizational dimension of educational innovation. The reviewed studies consistently demonstrate that instructional leadership, supportive school culture, professional learning communities, organizational support, and continuous academic supervision substantially strengthen the positive relationship between learning innovation and teacher performance. This finding confirms that educational innovation should be viewed as an organizational capability rather than merely an individual teacher initiative.

The synthesis also highlights the growing importance of teacher well-being and workload management. While learning innovation enhances instructional quality, excessive administrative responsibilities and technology-related demands may increase teacher stress and reduce instructional effectiveness. Furthermore, recent studies emphasize that although Artificial Intelligence offers significant opportunities to improve instructional efficiency, excessive dependence on AI-generated instructional content may gradually reduce teachers' creativity, reflective practice, instructional originality, and professional judgment. Consequently, AI should function as a complementary instructional resource that supports teachers rather than replacing their pedagogical expertise and creative decision-making.

Overall, this systematic literature review confirms that learning innovation contributes substantially to teacher performance only when pedagogical innovation is supported by adequate digital competence, effective instructional leadership, collaborative organizational culture, continuous professional learning, and balanced working conditions. Therefore, educational innovation should be conceptualized as a comprehensive ecosystem integrating technological, pedagogical, organizational, and human resource dimensions.

6. Research Implications

6.1 Theoretical Implications

This systematic literature review extends the existing body of knowledge by demonstrating that teacher performance is a multidimensional construct influenced by the interaction of pedagogical, technological, organizational, and psychological factors. While previous studies have frequently examined learning innovation as an independent instructional strategy, the present review suggests that its effectiveness should be understood through a systemic perspective in which digital competence, instructional leadership, organizational support, and teacher well-being jointly determine successful implementation.

Furthermore, the review contributes to educational innovation theory by integrating perspectives from educational technology, organizational behavior, instructional leadership, and teacher professional development. The findings indicate that learning innovation cannot be adequately explained through technology adoption theories alone but requires broader theoretical frameworks incorporating organizational learning, teacher self-efficacy, professional engagement, and institutional capacity for change.

Finally, the review identifies several research gaps requiring further investigation. Future empirical studies should examine the long-term influence of Artificial Intelligence on teachers' creativity, pedagogical decision-making, instructional autonomy, and professional identity. Although AI has significantly improved instructional efficiency, limited empirical evidence currently exists regarding its long-term consequences for teachers' innovative capacity and professional development.

6.2 Practical Implications

The findings provide several practical implications for educational policymakers, school leaders, and teacher education institutions.

First, educational policies should prioritize **teacher capacity building** rather than focusing exclusively on technological infrastructure. Investment in digital devices and educational platforms will have limited impact unless accompanied by continuous professional development programs that strengthen teachers' digital competence, instructional innovation skills, and AI literacy.

Second, school principals should establish organizational environments that encourage experimentation, collaboration, and continuous professional learning. Effective instructional leadership, professional learning communities, mentoring programs, and supportive school cultures create favorable conditions for teachers to implement innovative instructional practices sustainably.

Third, teacher professional development programs should increasingly emphasize pedagogical innovation rather than technological skills alone. Training should integrate instructional design, differentiated instruction, project-based learning, AI-assisted teaching, formative assessment, and reflective practice to strengthen teachers' pedagogical expertise in digitally transformed learning environments.

Fourth, educational institutions should carefully manage teacher workload during digital transformation. Learning innovation should simplify instructional processes rather than increase administrative burdens. Policies encouraging technology integration must therefore balance instructional innovation with teacher well-being, work-life balance, and occupational health.

Finally, educational stakeholders should establish clear ethical guidelines regarding the educational use of Artificial Intelligence. Rather than replacing teachers' professional judgment, AI should function as an assistive technology supporting instructional planning, assessment, and content development while preserving teachers' creativity, critical thinking, and pedagogical autonomy.

6.3 Policy Implications

The findings also provide evidence-based recommendations for educational policy. Governments and educational authorities should design innovation policies that simultaneously strengthen four strategic dimensions:

1. **Digital infrastructure** to ensure equitable access to educational technologies.
2. **Teacher digital competence** through continuous professional development.
3. **Instructional leadership and collaborative school culture** to sustain educational innovation.
4. **Teacher well-being** by reducing unnecessary administrative workload and promoting healthy working environments.

These four dimensions should be implemented simultaneously because improvements in only one dimension are unlikely to produce sustainable gains in teacher performance.

6.4 Future Research Directions

This review identifies several opportunities for future research.

First, more longitudinal studies are needed to examine how sustained implementation of learning innovation influences teacher performance over time.

Second, future studies should investigate the dual role of Artificial Intelligence as both an enabler of instructional innovation and a potential challenge to teachers' creativity and professional autonomy.

Third, comparative cross-country research should explore how differences in educational policy, digital infrastructure, and organizational culture influence the effectiveness of learning innovation.

Finally, future empirical studies should develop integrated models incorporating learning innovation, digital competence, instructional leadership, organizational support, teacher engagement, self-efficacy, and well-being to explain teacher performance more comprehensively.

8. Scientific Contribution and Novelty of This Systematic Literature Review

This systematic literature review offers several significant contributions to the existing body of knowledge on learning innovation and teacher performance.

First, this review integrates evidence from both **nationally accredited Indonesian journals (SINTA)** and **internationally indexed journals (Scopus)** into a single comprehensive synthesis. By combining local and global perspectives, the study provides a more holistic understanding of learning innovation across diverse educational contexts while addressing the limited integration between national and international research in previous review studies.

Second, this review identifies **five overarching themes** that explain the relationship between learning innovation and teacher performance. Rather than merely confirming a positive association between the two variables, the study develops a thematic framework that explains the mechanisms through which learning innovation enhances teacher performance under different pedagogical, technological, organizational, and professional conditions.

Third, this review incorporates **Artificial Intelligence (AI)** as an emerging dimension of educational innovation. The findings demonstrate the dual role of AI in contemporary education. On one hand, AI enhances instructional efficiency by supporting lesson planning, learning resource development, assessment, and personalized instruction. On the other hand, excessive reliance on AI may reduce teachers' creativity, pedagogical reflection, instructional originality, and professional autonomy if AI-generated content replaces rather than supports teachers' professional judgment and instructional decision-making.

Finally, this review proposes a **systemic conceptual framework** suggesting that improvements in teacher performance are not determined solely by learning innovation. Instead, teacher performance is influenced by the interaction among learning innovation, digital competence, instructional leadership, school organizational culture, teacher well-being, and the responsible integration of Artificial Intelligence into teaching and learning. This holistic perspective advances existing literature by positioning educational innovation as a multidimensional ecosystem rather than an isolated instructional intervention.

Overall, these contributions provide both theoretical and practical value for future research, educational policy, and school practice, while offering a comprehensive framework for understanding how learning innovation can sustainably improve teacher performance in the era of digital transformation and Artificial Intelligence.

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