

Transformation of Educators' Roles in the Implementation of Deep Learning in Vocational Education: A Systematic Literature Review

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Abstract

The transformation of vocational education requires educators to move beyond their traditional role as knowledge transmitters toward becoming designers, facilitators, mentors, and reflective practitioners capable of creating deep, contextual, and workplace-relevant learning experiences. This study aims to analyze the transformation of educators' roles in the implementation of deep learning in vocational education. A Systematic Literature Review (SLR) was conducted following the PRISMA 2020 framework. Articles were retrieved from the Scopus database within the 2020–2026 publication period. Following the identification, screening, and eligibility assessment processes, 15 articles met the inclusion criteria and were analyzed using descriptive quantitative analysis and narrative synthesis. The analysis focused on research trends and contexts, transformations in educators' roles, learning models or strategies, the use of technology and professional development, as well as supporting factors, barriers, and research gaps. The findings indicate that educators' roles have shifted from knowledge transmitters toward learning designers, facilitators, mentors/coaches, reflective practitioners, and industry and technology collaborators. This transformation is supported by project-based learning, problem-based learning, lesson study, continuing professional development, professional learning communities, digital technology, and reflective practice. Key supporting factors include institutional support, training, technology availability, professional collaboration, and industry partnerships, while major barriers involve limited time, inadequate facilities, insufficient digital competence, and weak organizational support. The review confirms that effective deep learning implementation in vocational education requires continuous, adaptive, collaborative, and technology-integrated transformation of educators' roles aligned with learners' needs and changing workplace demands.

Keywords: Educators' Roles, Deep Learning, Vocational Education, Systematic Literature Review

INTRODUCTION

Vocational education plays a strategic role in preparing human resources who possess the knowledge, technical skills, adaptive capacities, professional attitudes, and readiness required to respond to changes in the world of work. Vocational education differs from general education in that its learning processes are primarily oriented toward the mastery of competencies directly associated with occupational requirements, technological developments, industry demands, and professional practices. These characteristics place vocational educators in a complex position, as they are expected not only to demonstrate strong mastery of subject-specific knowledge but also to design meaningful learning experiences that integrate theory, practical application, technology, and authentic workplace contexts. In the digital era, the competencies required of Technical and Vocational Education and Training (TVET) educators have become increasingly

multidimensional, making it essential to develop pedagogical, professional, technological, and adaptive competencies in an integrated and continuous manner (Diao, J., & Qu, 2024).

Changes in the nature and demands of the contemporary workplace have contributed to a fundamental shift in the learning paradigm of vocational education. Learning can no longer be confined to the acquisition of procedural knowledge, routine skills, or the reproduction of information. Instead, vocational education is increasingly expected to foster deep conceptual understanding, problem-solving competence, critical thinking, collaboration, creativity, and the ability to apply knowledge in authentic workplace contexts. This transformation requires a corresponding redefinition of the educator's role, from that of the primary transmitter of knowledge to that of a learning designer, facilitator, mentor, advisor, evaluator, collaborator, and mediator between educational institutions and the world of work. Within the context of vocational education in the digital era, the development of educators' competencies therefore needs to accommodate the multiple professional roles performed by teachers while remaining responsive to the actual demands of schools, industries, and workplace environments.

One pedagogical approach that has gained increasing attention within contemporary educational transformation is deep learning. In this study, deep learning does not refer to computational deep learning within the field of artificial intelligence, but rather to a pedagogical approach that promotes robust conceptual understanding, the integration of new knowledge with prior experience, reflective thinking, critical inquiry, and the application of learning outcomes in authentic contexts. This approach is particularly relevant to vocational education because professional competence cannot be developed solely through memorization or repetitive procedural practice. Rather, learners need to understand the rationale underlying particular actions, solve workplace-related problems, make informed decisions, and transfer acquired knowledge and skills across diverse professional situations.

The implementation of deep learning in vocational education can be grounded in the principles of mindful learning, meaningful learning, and joyful learning. These principles may be operationalized through project-based learning, digital reflection, interdisciplinary collaboration, technology-enhanced instruction, and authentic assessment practices involving portfolios, presentations, and reflective journals. In addition, the successful implementation of deep learning in vocational schools requires sustained efforts to strengthen teachers' professional capacities. Transformative pedagogical training and the development of Professional Learning Communities (PLCs) are therefore considered essential mechanisms for supporting educators in redesigning learning experiences, promoting reflective practice, and responding effectively to the evolving demands of vocational education (Utomo et al., 2025). Thus, the implementation of deep learning in vocational education fundamentally transforms not only how students learn but also how educators understand and enact their professional roles.

To address this gap, the present study employs a Systematic Literature Review (SLR) to systematically identify, evaluate, and synthesize research on the transformation of educators' roles in the implementation of deep learning in vocational education. The SLR approach was selected because it enables studies conducted across diverse contexts, methodological traditions, and research foci to be integrated into a more comprehensive mapping of the development of knowledge in this field. The review process follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to ensure that the identification, screening, eligibility assessment, and final selection of studies are conducted transparently and in a replicable manner.

Based on these objectives, the study is guided by the following research questions: (1) What are the publication trends and research contexts concerning the transformation of educators' roles in the implementation of deep learning in vocational education? (2) What forms of educators' role transformation

emerge in the implementation of deep learning in vocational education? (3) What instructional models or strategies are used to support the transformation of educators' roles? (4) How do technology integration and professional development support the effectiveness of deep learning implementation? (5) What factors facilitate or hinder the transformation of educators' roles, and what research gaps remain?

Through these research questions, the review is expected not only to provide a systematic mapping of the existing literature but also to develop a conceptual synthesis of changing educators' roles within the deep learning ecosystem of vocational education. The findings are expected to provide a foundation for formulating professional development models that are collaborative, reflective, adaptive, technology-enhanced, and closely aligned with the evolving needs of the world of work. In addition to contributing to the advancement of scholarship in vocational education and educator professionalism, the findings of this SLR are also expected to offer practical implications for vocational schools, teacher education institutions, professional organizations, industry and business partners, and policymakers in designing educator competency-development programs that are responsive to the ongoing transformation of vocational education.

METHOD

Research Design

This study employed a Systematic Literature Review (SLR) design to systematically identify, select, evaluate, and synthesize studies related to the transformation of educators' roles in the implementation of deep learning in vocational education. An SLR is a form of secondary research that enables researchers to develop a comprehensive understanding of the evolution of a particular field through transparent, structured, and replicable procedures for literature searching, study selection, critical evaluation, and evidence synthesis (Page et al., 2021). Systematic approaches have also been increasingly employed to examine professional development, digital competence, changes in pedagogical practices, and the development of educators' competencies within vocational education contexts (Siliņa-Jasjukeviča et al., 2025; Rahmawati et al., 2025).

This review combined descriptive quantitative analysis to summarize article characteristics with narrative synthesis to examine educators' changing roles, competencies, teaching strategies, technology use, professional development, and implementation factors. The literature search used keywords related to vocational education, educator roles, deep learning, digital competence, and reflective practice. Data comprised peer-reviewed journal articles indexed in Scopus and published between 2020 and 2026. Deep learning referred to a pedagogical approach to deeper understanding, rather than an artificial intelligence technique.

Inclusion Criteria

Articles were included if they: (1) focused on educators in vocational education, VET, or TVET; (2) examined deep learning, changing educator roles, teaching practices, digital competence, professional development, or reflection; (3) were peer-reviewed journal articles indexed in Scopus and published between 2020 and 2026; (4) used quantitative, qualitative, mixed-methods, or systematic review designs; and (5) were available in full text in English or Indonesian.

Duplicates, unavailable full texts, and studies unrelated to vocational educators were excluded. Studies addressing deep learning solely as an artificial intelligence technique were also excluded, along with opinion articles, editorials, conference proceedings, books, book chapters, and non-peer-reviewed documents.

Data Collection Techniques

Data were collected through a systematic search of Scopus. Search terms combined vocational education terms, such as "vocational education," "vocational teacher," and "TVET teacher," with "deep

learning,” “teacher role,” “professional development,” “digital competence,” “reflective practice,” and “teacher transformation.”

Study selection followed identification, screening, eligibility assessment, and inclusion, reported using PRISMA 2020 (Page et al., 2021). Duplicate records were removed before titles and abstracts were screened for relevance. The remaining full texts were assessed against the inclusion criteria, resulting in 15 articles selected for analysis.

Systematic approaches have also been employed in recent studies within the field of vocational education. A systematic review approach has been used to synthesize research on the professional development of vocational education and training educators and the transfer of professional development outcomes into instructional practice. The review indicates that effective professional development for vocational educators is associated with active, collaborative, reflective, and authentic learning, as well as sustained institutional support (Siliņa-Jasjukeviča et al., 2025). Meanwhile, recent studies on deep learning in vocational education have increasingly emphasized the importance of teachers’ roles as facilitators, designers of learning experiences, reflective practitioners, and developers of contextualized learning that is responsive to students’ needs (Utomo et al., 2025; Wibowo Khurniawan et al., 2026). The diagram is used to provide a transparent overview of the entire literature selection process undertaken in this study.

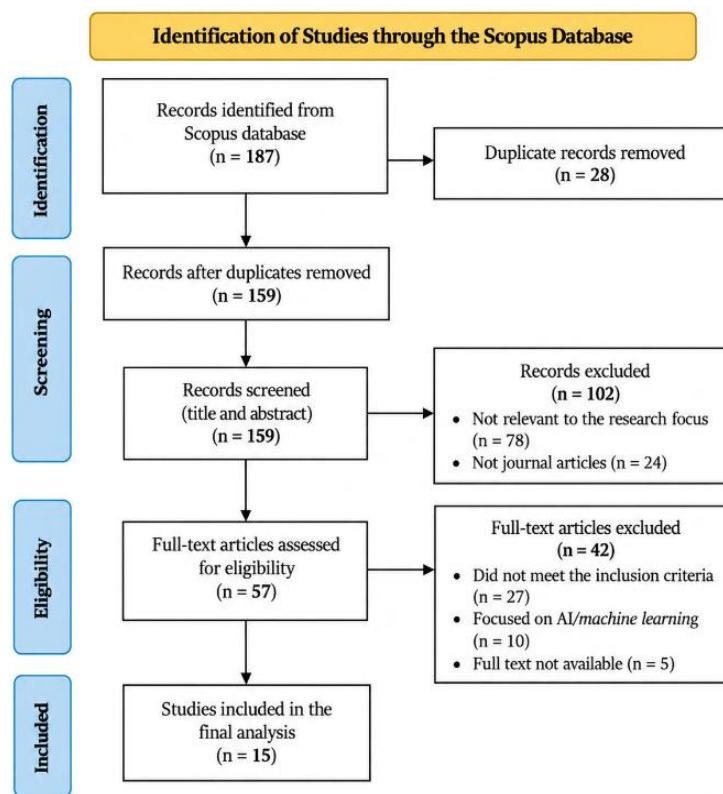


Figure 1. PRISMA 2020 Flow Diagram of the Article Selection Process

Source: Adapted from Page et al. (2021)

RESULT AND DISCUSSION

The findings are presented in seven main sections covering publication year, country or region and educational context, forms of educators' role transformation, models or strategies for implementing deep learning, the use of digital technology, professional development, collaborative learning and reflective practice, the effectiveness of educators' role transformation, as well as facilitating factors, barriers, and research gaps. A total of 15 Scopus-indexed articles that met the inclusion criteria were analyzed across these seven dimensions. The results of the analysis are presented in Table 1.

Table 1. Results of Article Analysis Based on the Established Criteria

No	Analysis Dimension	Analysis Results
1	Research Trends and Contexts	Publications from 2020–2026 covered VET, TVET, vocational high schools, and vocational teacher education contexts.
2	Transformation of Educators' Roles	Educators' roles shifted toward those of facilitators, learning designers, mentors, and reflective practitioners.
3	Learning Models or Strategies	The identified strategies included Project-Based Learning (PjBL), Problem-Based Learning (PBL), Lesson Study, mentoring, coaching, Professional Learning Communities (PLCs), Continuing Professional Development (CPD), and reflective practice
4	Technology and Professional Development	The integration of technology, CPD, collaboration, and reflective practices contributed to strengthening educators' pedagogical and digital competencies.
5	Facilitating Factors, Barriers, and Research Gaps	The main facilitating factors included institutional support and access to technology, whereas barriers involved limited time, inadequate facilities, and insufficient digital competence. Research gaps were identified in longitudinal studies and investigations of the impact of educators' role transformation on student learning outcomes.

Based on Table 1, it can be seen that research on the transformation of educators' roles in the implementation of deep learning in vocational education has moved beyond a general focus on changes in teachers' roles. The research has increasingly expanded toward the integration of innovative instructional strategies, digital technology, professional development, collaborative learning, reflective practice, and stronger connections with industry. These findings indicate that the transformation of educators' roles in deep learning requires a sustainable, adaptive, contextual, and integrated approach that is responsive to technological developments as well as to the needs of learners and the world of work.

Characteristics of the Analyzed Articles

To provide a more systematic overview of the research sources included in the review, the 15 articles that met the inclusion criteria were mapped according to author and year of publication, country or region of study, educational context, research method, research focus, and key findings. This mapping served as the basis for conducting a thematic synthesis of the transformation of educators' roles in the implementation of deep learning in vocational education. The characteristics of the 15 articles are presented in Table 2.

Table 2. Overview of the Reviewed Articles and Their Main Findings

No	Author (Year)	Country	Mind Finding
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1	Bükki & Fehérvári (2021)	Uganda	Collaboration supports professional development; however, deeper forms of collaboration remain constrained by organizational factors and school culture.
2	Arinaitwe (2021)	Hungary	Partnerships with workplaces strengthen authentic learning and the professional competence of vocational educators.
3	Zhou, Tigelaar, & Admiraal (2022)	International	A systematic review of 54 articles showed that professional learning occurs across schools, higher education institutions, and industry settings, contributing to changes in teachers' knowledge and professional practices.
4	Cattaneo, Antonietti, & Rausero (2022)	Switzerland	Digital competence is influenced by personal and contextual factors and plays an important role in transforming vocational teachers' instructional practices
5	Antonietti, Cattaneo, & Amenduni (2022)	Switzerland	Digital competence influences teachers' perceived usefulness of technology and their intention to integrate it into teaching and learning.
6	Antera (2022)	Swedish	Vocational teachers function as dual professionals who integrate occupational competence with pedagogical competence.
7	(Sandal, 2023)	Norway	Professional development helps teachers strengthen assessment for learning practices that are aligned with the characteristics of vocational learning
8	Hiim (2023)	Norway	Professional development helps teachers strengthen assessment for learning practices that are aligned with the characteristics of vocational learning
9	Diao & Qu (2024)	China	Needs-based training programs enhance TVET teachers' competencies and highlight the increasingly diverse roles of teachers in the digital era..
10	Xin, Tang, & Mou (2024)	China	A study involving 2,514 teachers developed a digital competence framework encompassing attitudes, skills, digital teaching and learning, student support, and collaboration.
11	Deschênes, Dionne, & Parent (2024)	Canada	Access to digital learning resources is necessary to strengthen the competencies of prospective vocational education teachers.
12	Antera & Teräs (2024)	Sweden	ITeachers' professional identities are formed through the integration of their previous occupational identities with their emerging identities as educators and members of communities of practice.
13	Zhou, Tigelaar, Wang, & Admiraal (2024)	China	The transfer of learning from workplace placements is influenced by teachers' capacities, program relevance, peer support, and opportunities to apply newly acquired competencies.

14	Rahmawati, Prestridge, Abdullah, & Widiaty (2025)	Indonesia	Barriers to transformation include access to technology, training opportunities, time constraints, professional communities, teachers' beliefs, and self-confidence.
15	Siliņa-Jasjukeviča et al. (2025)	International	Barriers to transformation include access to technology, training opportunities, time constraints, professional communities, teachers' beliefs, and self-confidence

Transformation of Educators' Roles

The analysis of the 15 articles shows that the implementation of deep learning in vocational education encourages a shift in educators' roles toward more active, adaptive, and learner-centered practices. This transformation can be grouped into five major roles: learning designer, facilitator, mentor or coach, reflective practitioner, and industry and technology collaborator. These five forms of educators' role transformation are presented in Table 3.

Table 3. Transformation of Educators' Roles and Their Main Functions

No	Transformation of Educators' Roles	Mind Function
1	Learner designer	Designs authentic, contextual, and meaningful learning experiences.
2	Facilitator	Encourages learners to become active, critical, collaborative, and independent.
3	Mentor / coach	Provides guidance, support, motivation, and feedback.
4	Reflective Practitioner	Continuously evaluates and improves teaching and learning practices.
5	Industry and Technology Collaborator	Integrates technology and connects learning with the needs of the world of work.

Based on Table 3, the transformation of educators' roles in deep learning reflects a shift from the traditional role of transmitting instructional content toward more complex roles as learning designers, facilitators, mentors, reflective practitioners, and industry and technology collaborators. This transformation highlights that vocational educators are expected not only to possess strong mastery of subject matter but also to create learning experiences that are contextual, adaptive, and responsive to students' needs and the evolving demands of the world of work.

Models or Strategies for Implementing Deep Learning

The synthesis of the 15 articles shows that the transformation of educators' roles in vocational education does not occur spontaneously; rather, it is supported by a range of instructional and professional development models and strategies. The most prominent strategies identified in the analyzed studies include continuing professional development, authentic workplace-based learning, professional collaboration, school–industry partnerships, digital competence development, mentoring, reflective learning, and assessment for learning. These strategies position educators as professional learners who continuously develop their knowledge, pedagogical skills, digital competencies, and understanding of workplace demands.

Table 4. Models and Strategies Supporting the Transformation of Educators' Roles

No	Model / Strategy	Role in Deep Learning
1	<i>Continuing Professional Development</i> (CPD)	Continuously strengthens pedagogical and professional competencies.
2	Work-based learning/work placement	Connects learning with authentic workplace situations and occupational competencies.
3	Professional Collaboration	Encourages the sharing of experiences, knowledge, and collaborative problem-solving among teachers.
4	School–Industry Partnership	Strengthens the relevance of learning to workplace and industry needs.
5	Digital Competence Development	Supports the integration of technology into instructional planning and implementation.
6	<i>Mentoring and Coaching</i>	Provides guidance, feedback, and support for educators' professional development.
7	<i>Reflective Practice</i>	Enables educators to evaluate and continuously improve their teaching and learning practices.

Based on Table 4, strategies for improving the quality of learning in vocational education tend to shift from isolated training approaches toward professional development that is contextual, collaborative, reflective, and closely connected to the world of work. (Zhou et al., 2022) showed that vocational educators' professional learning takes place across multiple environments, including schools, educational institutions, and workplaces, and that these experiences can ultimately influence teachers' knowledge and instructional practices. This finding indicates that professional experiences beyond the classroom constitute an important component of educators' role transformation.

Connection with the world of work is also a defining characteristic of vocational education. Him (2023) demonstrated that collaboration between teachers and industry can strengthen the authenticity and relevance of vocational learning. Similarly (Zhou et al., 2024) emphasized that the successful transfer of experiences gained through work placement into instructional practice is influenced by teachers' individual capacities, program relevance, peer support, and opportunities to apply newly acquired knowledge. These findings suggest that deep learning in vocational education requires a strong connection among professional experience, workplace contexts, and pedagogical practice.

The development of digital competence also constitutes an important strategy in the transformation of educators' roles. (Cattaneo et al., 2022) and (Antonietti et al., 2022) showed that digital competence is associated with teachers' readiness and willingness to integrate technology into teaching and learning. More recently, (Xin et al., 2024) identified key dimensions of TVET teachers' digital competence, including attitudes toward technology, digital skills, digitally supported teaching and learning, learner support, and professional collaboration. Accordingly, digital competence should not be viewed merely as a technical skill; rather, it forms part of educators' pedagogical capacity to design learning experiences that are more adaptive, responsive, and relevant.

Use of Technology and Professional Development in Supporting Deep Learning

The analysis indicates that digital technology and professional development are two key elements supporting the transformation of educators' roles in the implementation of deep learning in vocational education. Technology is used not only as a medium for delivering instructional content but also to support

lesson planning, the development of learning resources, assessment, communication, and collaboration between educators and learners. In this context, educators are expected to possess digital competencies that are integrated with pedagogical expertise so that technology can be used appropriately and effectively in accordance with instructional objectives.

Table 5. Use of Technology and Professional Development in Deep Learning

Aspect	Contribution to the Transformation of Educators' Roles
Digital Technology	Supports instructional design, learning resources, assessment, communication, and innovation in teaching and learning
Digital Competence	Strengthens educators' ability to select and use technology in accordance with instructional needs.
Professional Development	Enhances educators' knowledge, pedagogical skills, and capacity to adapt to educational change
<i>Work Placement</i>	Updates professional competencies and strengthens the relevance of learning to workplace demands
Continuous Professional Learning	Encourages educators to engage in ongoing learning, reflection, and continuous improvement of instructional practices.

Based on Table 5, the effective use of technology largely depends on educators' digital competence. (Cattaneo et al., 2022) showed that vocational teachers' digital competence is influenced by both personal and contextual factors and plays an important role in transforming instructional practices. (Xin et al., 2024) further demonstrated that TVET teachers' digital competence encompasses not only technical skills but also digital attitudes, digitally supported teaching and learning, learner support, and professional collaboration.

In addition to technology, continuous professional development enables educators to update their pedagogical and professional competencies in response to changes in the world of work. (Zhou et al., 2022) showed that the professional learning of vocational teachers can take place across schools, higher education institutions, and workplace settings. Thus, the effectiveness of deep learning in vocational education is strongly influenced by educators' ability to integrate technology, pedagogical competence, professional experience, and continuous learning.

Facilitating Factors, Barriers, and Research Gaps

The synthesis indicates that the transformation of educators' roles in the implementation of deep learning is influenced by a range of facilitating and inhibiting factors. These factors originate from the individual educator level, the school environment, institutional support, the availability of technology, and the relationship between educational institutions and the world of work.

Table 6. Facilitating Factors, Barriers, and Research Gaps

Aspect	Hasil Analisis
Faktor pendukung	Leadership support, peer collaboration, industry partnerships, access to technology, training opportunities, and opportunities to apply newly acquired competencies.
Faktor penghambat	Time constraints, heavy workloads, inadequate facilities, limited digital competence, and weak institutional support
<i>Research Gap</i>	Limited longitudinal research, insufficient evaluation of the impact on student learning outcomes, and a lack of studies conducted within vocational education contexts in developing countries

Institutional support constitutes one of the key factors influencing the successful transformation of educators' roles. Opportunities for collaboration, access to training, availability of technology, and opportunities to apply the outcomes of professional development can strengthen changes in instructional practice. (Zhou et al., 2024) showed that the successful transfer of learning from work placement into teaching practice is influenced by teachers' capacities, program relevance, peer support, and opportunities to apply newly acquired competencies.

Conversely, time constraints, heavy workloads, unequal access to technology, and limited institutional support can hinder the transformation process. (Rahmawati et al., 2025) demonstrated that access to technology, training opportunities, time availability, professional communities, teachers' beliefs, and self-confidence are among the factors influencing instructional transformation in vocational education.

From the perspective of the research gap, relatively few studies have examined educators' role transformation longitudinally or assessed the extent to which such changes directly affect students' competencies and learning outcomes. Research integrating digital technology, professional development, industry collaboration, and reflective practice within a single model also remains limited. Therefore, future research should focus on developing and testing more comprehensive models of educators' role transformation, particularly within vocational education contexts in developing countries.

The transformation of educators' roles in vocational education is shaped by both individual and institutional factors. Organizational support, leadership, self-efficacy, digital competence, and a conducive professional environment are important in facilitating changes in instructional practice. (Lin et al., 2024) showed that the transition toward competency-based curricula requires vocational teachers to adjust both their professional identities and teaching practices, while (Zhong, Z., & Juwaheer, 2024) emphasized that the development of digital competence in TVET should adopt a whole-institution approach involving leaders, teachers, and students in an integrated manner. (Li et al., 2025) further demonstrated that a supportive organizational climate can strengthen the self-efficacy and professional identity of vocational teachers. In the Indonesian context, (Habibi et al., 2025) found that management strategies and commitment, knowledge management, and motivation are significantly associated with vocational school teachers' performance. Thus, successful educator transformation cannot rely solely on individual teachers' capacities; it also requires institutional support, effective leadership, continuous professional development, and an adequate digital ecosystem.

Nevertheless, several research gaps remain. Existing studies have predominantly relied on surveys, self-reported perceptions, or cross-sectional competence measurements, resulting in limited evidence concerning the sustainability of changes in teachers' practices and their impact on student learning outcomes. (Qin et al., 2026) showed that the assessment of vocational teachers' digital competence still largely depends on subjective surveys and manual observations, indicating a need for more objective, data-driven approaches capable of providing continuous feedback. Future research should therefore employ longitudinal and mixed-methods designs, examine the relationship between educators' role transformation and student learning outcomes, and develop models that integrate pedagogical, professional, and digital competencies with organizational support and stronger connections to the world of work. These gaps also create opportunities to develop more context-sensitive models of educators' role transformation for vocational education, particularly in developing countries and within the Indonesian vocational high school context.

Discussion

Previous studies have examined several aspects of instructional transformation in vocational education. Utomo et al. (2025) emphasized pedagogical training and professional learning communities as strategies for supporting deep learning in vocational high schools. Their findings highlight the importance of preparing educators to design meaningful activities and reflect collaboratively on teaching practice. Rahmawati et al. (2025) examined vocational educators' digital competence and identified barriers related to infrastructure, training opportunities, time, and confidence in using technology. Their findings indicate that educators' capacity to integrate technology depends on both individual competence and institutional support. Meanwhile, Siliņa-Jasjukeviča et al. (2025) highlighted the importance of relevant, active, collaborative, reflective, and authentic professional development for vocational educators. These studies collectively suggest that pedagogical preparation, digital competence, and sustained professional learning are important conditions for changing instructional practice.

However, these studies address different dimensions of educator development, leaving the connections between these dimensions and educators' changing roles insufficiently synthesized. Utomo et al. (2025) focused on strategies for implementing deep learning, Rahmawati et al. (2025) examined digital competence and its barriers, and Siliņa-Jasjukeviča et al. (2025) investigated professional development more broadly. A systematic synthesis is therefore needed to explain how these dimensions relate to educators' roles as learning designers, facilitators, mentors, reflective practitioners, and industry collaborators. The present review addresses this gap by integrating evidence on role transformation, supporting strategies, required competencies, and implementation conditions within vocational education.

Implication Research

This study contributes to educational management by positioning the transformation of vocational educators' roles as an organizational responsibility that requires coordinated leadership, professional development, resource allocation, and industry partnerships. The synthesis connects changes in teaching practice with the institutional conditions needed to support educators as learning designers, facilitators, mentors, and reflective practitioners. It provides a conceptual basis for aligning educator development with school planning and workplace demands. In practice, the findings suggest that vocational school leaders should provide time for collaborative reflection, organize professional learning around educators' needs, and align technology investment with pedagogical objectives. These contributions can inform the design and evaluation of management strategies that support the implementation of deep learning in vocational education.

CONCLUSION

This systematic literature review indicates that implementing deep learning in vocational education involves a shift in educators' roles from knowledge transmitters to learning designers, facilitators, mentors, reflective practitioners, and collaborators with industry and technology partners. Continuous professional development, digital technology integration, professional collaboration, and reflective practice support this transformation, while limited time, inadequate facilities, insufficient digital competence, heavy workloads, and uneven institutional support hinder its implementation. For educational management, these findings position educator role transformation as an organizational responsibility requiring coordinated leadership, resource allocation, and professional learning opportunities. Vocational school leaders should therefore align educator development, technology provision, and industry partnerships with pedagogical objectives and provide time for educators to apply and evaluate new teaching practices.

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