

Transforming Teaching: Evolving Professional Competencies in Response to Globalization and Technological Innovation

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ABSTRACT

The rapid transformation of education due to globalization, technological innovation, and evolving societal expectations necessitates a redefinition of teachers' professional competencies. This study examines how traditional roles centered on content delivery are expanding to include advanced pedagogical skills, digital literacy, cultural responsiveness, and emotional intelligence. Teachers now face complex challenges such as integrating technology effectively, addressing diverse learner needs, bridging the digital divide, and supporting students' social-emotional well-being. These demands require continuous professional development, reflective practice, and adaptability to new learning environments, including blended and online formats. The findings highlight the importance of holistic competencies that enable educators to foster critical thinking, personalized learning, and inclusive classrooms. The study concludes that aligning teacher preparation and capacity-building initiatives with these emerging competencies is vital to empower educators as agents of transformative change. Ultimately, investing in teacher competencies supports the creation of equitable, innovative, and future-ready education systems capable of preparing learners for a complex global society.

Keywords : *Teacher Competencies, Digital Literacy, Inclusive Education, Professional Development.*

1. INTRODUCTION

The study of a teacher's professional competencies in the context of changing the education paradigm has emerged as an urgent and multifaceted area of inquiry, particularly as globalization, technological innovations, and shifting societal expectations continue to redefine the aims and processes of education. In today's rapidly evolving learning environments, traditional models that emphasized rote memorization and teacher-centered instruction are increasingly giving way to pedagogical approaches grounded in critical thinking, learner autonomy, inclusivity, and the dynamic

integration of digital tools. Against this backdrop, understanding and analyzing the competencies that teachers must cultivate has become pivotal, not only for ensuring academic excellence but also for nurturing students' social, emotional, and ethical development. Professional competencies now encompass a diverse range of skills, knowledge, and attitudes—from subject matter expertise and pedagogical proficiency to cultural responsiveness, collaborative practice, and reflective self-improvement. As educational systems undergo profound transformations driven by policies advocating competency-based education, personalized learning pathways, and 21st-century skills, teachers are expected to embrace lifelong learning, adapt to diverse student needs, and leverage innovative instructional strategies to create meaningful learning experiences. Moreover, the rise of blended and online learning environments has intensified the demand for digital literacy, adaptability, and the ability to design and facilitate engaging virtual learning communities. In this context, the study of teacher competencies is not merely an academic exercise but a foundational imperative to equip educators with the tools and dispositions necessary to navigate complexity and uncertainty [1]. The challenges posed by the digital divide, cultural diversity, and growing mental health concerns among students further underline the necessity for teachers to demonstrate resilience, empathy, and an ethical commitment to equity and inclusion. Consequently, this research explores how teachers' professional competencies are being reconceptualized and assessed within contemporary education systems, examining the interplay between policy frameworks, institutional expectations, and individual professional development [2]. It also seeks to illuminate the gaps and opportunities that arise as educators strive to align their practice with emerging pedagogical paradigms that prioritize student agency, interdisciplinary learning, and the cultivation of skills relevant to the knowledge economy. Through critically analyzing these shifts, this study aims to contribute to a deeper understanding of the evolving professional identity of teachers and to inform strategies for capacity building that can support them in meeting the complex demands of modern education. Ultimately, investigating teachers' competencies within this changing paradigm offers valuable insights into how educational transformation can be effectively actualized through empowered, competent, and reflective practitioners who are prepared to lead learning in diverse and uncertain futures [3].

1.1 Changing Educational Paradigm

The changing educational paradigm reflects a profound transformation in how knowledge is created, shared, and applied in today's interconnected and rapidly evolving world. Traditional approaches centered on rote memorization, passive learning, and standardized instruction are increasingly seen as insufficient for preparing students to thrive in complex, unpredictable environments shaped by globalization, technological innovation, and shifting societal needs. Instead, education is moving toward learner-centered models that emphasize critical thinking, creativity, collaboration, and problem-solving. Digital technologies have accelerated this shift by enabling unprecedented access to information, fostering new forms of communication, and supporting personalized learning pathways tailored to diverse learners. The integration of online platforms, blended learning, and interactive tools has redefined the roles of both teachers and students, positioning educators as facilitators and guides rather than mere transmitters of content. At the same time, the growing recognition of the

importance of social-emotional learning, cultural responsiveness, and ethical awareness underscores the need to cultivate the whole child, not only their cognitive abilities [4]. Policies promoting 21st-century skills and competency-based education reflect an urgent desire to align schooling with the demands of the knowledge economy, where adaptability, innovation, and lifelong learning have become essential. These changes also bring challenges, including addressing educational inequities exacerbated by the digital divide, meeting the diverse needs of learners from varied cultural and socioeconomic backgrounds, and supporting student well-being in increasingly complex social environments. For teachers, the changing paradigm requires continuous professional growth, openness to new pedagogical strategies, and the capacity to integrate technology meaningfully into instruction. It also demands a commitment to fostering inclusive, equitable learning spaces where all students can develop the skills and dispositions necessary for engaged citizenship and personal fulfillment. Ultimately, the changing educational paradigm represents a shift toward more holistic, flexible, and responsive systems of learning that honor diversity, promote empowerment, and prepare individuals to contribute thoughtfully and ethically to an interconnected global society [5].

1.2 Expanding Professional Competencies

Broadening Skill Sets Beyond Subject Mastery: In the context of modern education, teachers' professional competencies have expanded well beyond traditional subject matter expertise. While deep content knowledge remains essential, today's educators are also expected to demonstrate advanced pedagogical skills that foster critical thinking, creativity, and problem-solving among diverse learners. This means designing lessons that are not only informative but also engaging, relevant, and adaptable to students' varied backgrounds and abilities. Teachers must be able to integrate technology effectively, using digital tools to create interactive learning experiences and to differentiate instruction in ways that support personalized learning goals. Additionally, they are increasingly required to assess learning in holistic ways, combining formative and summative methods that capture students' growth in both academic and social-emotional domains. This broader range of skills reflects a shift toward viewing teachers as facilitators and guides who can empower students to take ownership of their learning [6].

Cultivating Reflective, Culturally Responsive Practice: Alongside pedagogical innovation, professional competencies today encompass cultural responsiveness, emotional intelligence, and reflective practice. Teachers are called to create inclusive learning environments that honor diversity and promote equity. This requires sensitivity to cultural and linguistic differences, awareness of potential biases, and the ability to adapt curriculum and teaching strategies to meet the needs of all students. Equally important is the cultivation of empathy and ethical commitment, as teachers play a critical role in supporting students' mental health and well-being. Reflective practice regularly examining one's beliefs, decisions, and instructional approaches is essential for continuous improvement and professional growth. In this way, expanding competencies empower teachers to respond to the challenges of a rapidly changing world while remaining anchored in core values of care, respect, and lifelong learning [7].

1.3 Demands of New Learning Environments

The demands of new learning environments have redefined what it means to teach and learn in the 21st century, placing unprecedented expectations on educators to integrate technology, foster learner autonomy, and create inclusive spaces that support diverse needs and aspirations. With the rise of blended and online learning, teachers must be adept not only in subject knowledge but also in digital literacy, using virtual platforms, multimedia resources, and collaborative tools to design engaging, interactive experiences that transcend the traditional classroom. This shift requires a deep understanding of how to scaffold learning in digital spaces, manage online communities, and ensure that all students have equitable access to technological resources, thereby addressing the persistent challenges of the digital divide [8]. In addition, contemporary learning environments emphasize personalized learning pathways, where students progress at their own pace and follow individualized goals tailored to their strengths, interests, and backgrounds. To support this, teachers must master differentiated instruction and continuous formative assessment to monitor progress and provide targeted feedback. Social-emotional learning has also become a central component, with educators expected to nurture students' resilience, empathy, and well-being amid growing concerns about mental health and social pressures. This holistic approach demands that teachers act as mentors and facilitators, cultivating trust and strong relationships that encourage student agency and self-efficacy. The rapid pace of technological and societal change further underscores the need for teachers to be adaptable and committed to lifelong learning, as new tools, platforms, and pedagogical research continually reshape best practices. Finally, educators are increasingly called to develop culturally responsive practices that validate students' identities and experiences while promoting global awareness and ethical citizenship. Meeting these demands is both challenging and rewarding, as it empowers teachers to inspire learners to think critically, collaborate effectively, and contribute meaningfully to an interconnected world [9].

1.4 Challenges and Responsibilities

Teachers today face a complex landscape of challenges and responsibilities that extend far beyond delivering curriculum, as they are called to navigate issues of equity, inclusion, mental health, and rapid technological change while maintaining high standards of academic excellence. One of the foremost challenges is addressing the persistent digital divide, which leaves many students without reliable access to devices or the internet, thereby widening achievement gaps and limiting opportunities for participation in blended and online learning. At the same time, teachers are increasingly responsible for creating culturally responsive classrooms that honor and integrate diverse backgrounds, languages, and perspectives, requiring both deep cultural awareness and a commitment to confronting bias and discrimination. The growing prevalence of anxiety, depression, and other mental health issues among young people places additional demands on educators to provide social-emotional support, build trusting relationships, and foster safe learning environments where students feel valued and understood. Teachers must also balance these interpersonal responsibilities with the expectation to continuously update their professional knowledge and skills, integrating new technologies and pedagogical methods while adapting to shifting standards and

policy directives. The pressure to personalize learning, differentiate instruction, and monitor individual progress further intensifies the workload, demanding careful planning, flexibility, and sustained reflection. Moreover, as schools become hubs for community engagement and innovation, teachers are often tasked with collaborating with families, support staff, and external organizations to address complex challenges that impact learning outcomes. This evolving role requires resilience, empathy, and ethical judgment, as educators must make decisions that protect students' welfare while promoting fairness and opportunity for all. Ultimately, the challenges and responsibilities confronting teachers underscore the importance of professional support systems, ongoing development, and recognition of the vital role educators play in shaping not only academic success but also the character and well-being of the next generation [10].

1.5 Purpose and Impact of the Study

Evolving Competencies in a Transforming Educational Landscape: The primary purpose of the study is to critically examine how teachers' professional competencies are being redefined in response to profound changes in education driven by globalization, technological advancement, and shifting societal expectations. By exploring the diverse skills, knowledge, and dispositions teachers now require—from digital literacy and innovative pedagogy to cultural responsiveness and social-emotional support—the research seeks to clarify what it means to be an effective educator in contemporary contexts. This includes investigating how policy reforms, competency-based frameworks, and the rise of learner-centered approaches influence teachers' professional identities and daily practices. The study aims to generate a comprehensive understanding of these evolving demands so that educators, policymakers, and institutions can more effectively align teacher preparation and professional development with the realities of modern classrooms. In doing so, it provides a foundation for reimagining teacher education programs to equip educators with the tools and mindsets essential for success in diverse and dynamic learning environments.

Informing Strategies for Capacity Building and Educational Transformation: Beyond describing changes in competencies, the study has the broader impact of informing strategies and policies that can empower teachers to lead meaningful educational transformation. By identifying gaps between existing practices and emerging expectations, the research offers insights into where targeted support, resources, and training are most urgently needed. This evidence can guide institutions in designing professional development initiatives that foster continuous growth, reflective practice, and collaborative learning among teachers. Additionally, the study highlights how strengthened competencies contribute not only to improved student outcomes but also to the creation of inclusive, equitable learning environments that honor diversity and promote well-being. In this way, the findings serve as a catalyst for systemic change, emphasizing the essential role of empowered, competent educators in preparing learners to thrive in a rapidly changing world. Ultimately, the study aspires to contribute to a shared vision of education where teachers are valued, supported, and equipped to inspire future generations [11].

2. RELATED REVIEWS

Rofi'i et al. (2023) had presented a case study at the English Teacher Forum in Majalengka, which had focused on improving teachers' professional competence in integrating technology into their teaching practices. They had addressed the challenges faced by teachers in effectively incorporating technology and had explored strategies to enhance their skills and abilities. Their qualitative research had applied a case study approach through structured interview techniques and document analysis. The findings had revealed that many teachers in the forum had lacked the confidence and skills to integrate technology effectively, thereby hindering the educational potential of digital tools. Nevertheless, significant improvements had been observed in the professional competence of English teachers, such as mastering teaching materials, managing classes, utilizing media and learning resources, understanding educational foundations, managing learning interactions, and assessing learning achievements for the benefit of instruction. These improvements had been supported through professional development programs, peer coaching, access to resources, and continuous support. Furthermore, students had demonstrated increased motivation and enhanced learning outcomes. The study had highlighted the importance of ongoing support and training for teachers as well as the necessity of investing in technological infrastructure. The research findings and recommendations had aimed to guide educators and policymakers in promoting technology-integrated learning environments in Majalengka and similar contexts, ultimately enhancing student learning experiences and outcomes.

Hammer and Ufer (2023) had explored the significance of teachers' professional competence in selecting tasks and preparing their implementation, recognizing these abilities as crucial for promoting meaningful learning. They had discussed that variations in teachers' professional knowledge and their individual planning processes might account for differences in the quality of planning products, including task selection and the preparation of implementation. Through a cross-sectional study, they had assessed both prospective and in-service secondary teachers with respect to their professional knowledge, task-related lesson planning processes, and planning products focused on fraction learning. Their findings had indicated that professional knowledge was linked to the quality of teachers' planning processes, with this quality further explained by teachers' noticing and reasoning during the task analysis stage.

Nurdiansyah et al. (2023) had examined the professional competence of elementary school teachers in implementing thematic learning, recognizing that online thematic learning had required teachers to be creative in designing meaningful, practical, and enjoyable experiences for students. Their qualitative descriptive study had relied on data gathered through interviews, observations, and documentation, with the validity ensured by triangulation techniques and sources. The research participants had included principals as well as lower- and upper-grade teachers. They had analyzed the data using the Miles and Huberman model. Their findings had revealed that teachers had demonstrated professional competence through a solid understanding of subject matter, structures, concepts, and scientific mindsets. The study had further shown that teachers had successfully implemented online thematic learning by mastering basic competency standards, developing creative

learning materials, maintaining ongoing professional growth, and utilizing information and communication technology. Overall, the evidence had indicated that elementary school teachers possessed the necessary professional competencies for effective thematic learning.

Yang and Kaiser (2022) had highlighted that teacher quality had remained a crucial determinant of instructional quality and student learning outcomes. They had recently put forward broadened perspectives on teacher competence, incorporating not only dispositions such as professional knowledge, but also situation-specific skills like noticing, extending from teachers' attitudes to their actual performance in the classroom. It had been observed that mathematics education researchers had further enriched the concept of teacher competence, created new instruments for measuring it, and examined effective strategies to foster its development. Numerous empirical investigations had been conducted to evaluate how teacher professional competence influenced instructional quality and student achievement in mathematics. Through their review, the authors had aimed to summarize the current state of knowledge in this area and to identify promising directions for future research.

Loresius et al. (2022) had aimed to identify and analyze the implementation of academic supervision for enhancing teachers' professional competence. They had adopted a qualitative method with a case study design, collecting data through observations and interviews, and subsequently analyzing the interview data using manifest analysis. Their findings had indicated that academic supervision conducted by school principals had assisted, guided, and motivated teachers in developing their professional abilities, particularly in classroom teaching and learning processes. A systematic and well-planned supervision approach had enabled teachers to integrate and apply their skills more effectively with the help of peer input. Moreover, teachers had benefited from reflective practices, which had been recognized as essential elements of teacher professionalism. Supervisors and teachers had also gained a deeper understanding of the significance of academic supervision in improving professional competence, which had ultimately contributed to better student learning outcomes.

Antera (2021) had reviewed and discussed the variety of interpretations surrounding the concept of professional competence with reference to vocational teachers. It had been observed that earlier research on vocational teachers had largely focused on identifying which professional competencies these teachers possessed or should display, while comparatively little emphasis had been placed on how the very notion of competence was defined, thus revealing a gap concerning its perception and construction. Employing a conceptual analysis method (CAM) that had followed a systematic literature review process, the researcher had sought to identify both the common attributes of the concept and its related neighbouring concepts. The findings had suggested that only a limited number of studies had provided well-developed concept definitions. Moreover, there had been a general consensus among scholars about the principal attributes of professional competence, highlighting its situated and developmental nature as well as its inherent link to action. Regarding the practical use of the concept, distinct interconnections had emerged between professional competence, professionalism, performance, and qualification. It had also been noted that most definitions took the individual as the point of reference, while discussions concerning professional competence at a

collective level were largely absent. In view of the complexity of such concepts, the study had recommended that their application should be accompanied by a critical discussion of their various interpretations to minimize possible confusion.

Toom et al. (2021) had examined the extensive but often fragmented discussions around teachers' professional competencies, which had typically been associated with educational policy frameworks, teaching standards, and student learning outcomes. They had noted that the literature frequently presented scattered lists of teacher competencies without providing sufficient theoretical or empirical clarification regarding how, when, and why teachers actually developed and identified the competencies they required. The authors had highlighted that while teacher competencies had been widely addressed by multiple stakeholders as being central to the thinking practices involved in teachers' work, there remained a significant lack of research on what was concretely needed to achieve those competencies. Their study had aimed to address this gap by investigating the active and intentional processes through which teachers learned these competencies, particularly by exploring the connection between teacher competencies and professional agency for learning. By drawing upon prior research, they had sought to elaborate on the relationships between teachers' professional competencies and their agency for learning, encompassing both pre-service and in-service educators. Furthermore, they had attempted to answer critical questions regarding the features of teacher education programs that enabled student teachers to become both competent and agentic, as well as why those features deserved emphasis during teacher education and throughout a teacher's career.

Apriliyanti (2020) had investigated the role of teachers' professional development programs in enhancing teacher competencies through an observational case study. The study had aimed to examine the teachers' learning processes and the outcomes they achieved after attending the program. Five English teachers from Indonesia who had successfully passed the teachers' competence test after participating in the program had been selected as key informants. The research had sought to explore both the learning processes within the program and the challenges teachers faced in applying their newly acquired teaching knowledge. Three key findings had been highlighted. Firstly, it had been observed that pedagogic competences and professional competences had formed the foundation of the program's learning materials. Secondly, the study had revealed four major obstacles hindering the teachers in implementing their knowledge in classroom practices, including challenges related to adopting innovative teaching methods and designing creative lessons. Thirdly, the research had identified the advantages and difficulties encountered in applying professional learning development as a promising solution to improve English teachers' competencies in Indonesia.

Siri et al. (2020) had aimed to examine and analyze the role of teacher competence and commitment in supporting teacher performance. They had carried out their study on professional teachers working in Madrasah schools across all regencies and cities in Bali, covering a total of 906 teachers. The sample size had been determined through the Slovin formula at a 5% error rate, resulting in 277 teachers who had been proportionally distributed across nine districts and cities. Data collection had

been conducted through direct interviews using a pre-designed questionnaire, while the collected data had been processed using the SmartPLS 3.0 program. The study findings had revealed that teacher competence and commitment had significantly and positively affected the performance of professional teachers. Furthermore, teacher commitment had acted as a mediator between teacher competence and professional teacher performance. These results had provided useful insights into improving teacher performance, highlighting the importance of enhancing both teacher competence and commitment.

Ana et al. (2020) had conducted a study that aimed to analyze the competencies required of vocational school teachers in the era of Industry 4.0 based on the perspectives of policymakers. Their research had employed a quantitative approach involving 13 educational policymakers. The study had been motivated by the recognition that insufficient teacher competence posed a persistent challenge to vocational education in Indonesia. The findings had revealed that the priority competencies for vocational school teachers included pedagogical competence, social competence, personality competence, and professional competence. In terms of pedagogical competence, teachers had been expected to actualize the potential of students as part of their overall development, to possess a deep understanding of their students, and to comprehend student characteristics across physical, social, cultural, emotional, and intellectual domains. Furthermore, vocational school teachers had been expected to design and evaluate learning effectively. Regarding social competence, teachers had been required to communicate efficiently, empathically, and respectfully, demonstrating both oral and written skills, while also being able to enhance their communication through the use of ICT.

Sorge, Stender, and Neumann (2019) had revisited their earlier research on secondary science teachers' pedagogical content knowledge (PCK) to reinterpret it within the framework of the Refined Consensus Model (RCM) of PCK. They had argued that the RCM functioned not merely as a model of PCK but as a broader representation of science teachers' professional competence and its progression, highlighting the significance of wider knowledge bases along with the amplifiers and filters that mediated exchanges among these bases. Drawing upon data from two prior studies, they had re-examined how secondary science teachers' professional competence developed through such exchanges. The first study had employed paper-pencil tests to measure pre-service physics teachers' content knowledge (CK), collective PCK (cPCK), and pedagogical knowledge (PK), revealing stronger correlations between PK and cPCK in the early stages of teacher education and between CK and cPCK in later stages. Interpreting through the RCM lens, the second study had assessed cPCK similarly while adding instructional planning vignettes for personal/enacted PCK (pPCK/ePCK) and questionnaires on amplifiers and filters, finding that more experienced teachers showed greater influence of cPCK on pPCK/ePCK, shaped by motivational orientations. Altogether, their retrospective analysis had indicated that, consistent with the RCM, the development of cPCK drew upon wider professional knowledge bases, while cPCK substantially contributed to the development of pPCK/ePCK.

Smolikevych (2019) had analyzed the challenges related to teaching and learning within higher education institutions and had highlighted the particular features of teachers' professional activities and their essential teaching skills. The article had addressed the competencies required by educators to create a favorable and successful learning environment for a diverse student population. It had stressed the importance of supporting teaching, research, and the ongoing professional growth of faculty members, underlining the necessity of conditions that allowed teachers to realize their creative potential fully. Smolikevych had noted that both teachers and students should enjoy freedom in research, study, evaluation, and the acquisition and interpretation of new knowledge. The article had identified the core tasks, skills, and responsibilities of educators within the global educational framework, aiming to help academic service recipients adapt and thrive in their learning journeys. Furthermore, the study had described the effective practices of American pedagogical skills centers as a source of inspiration for Ukraine's higher education system, seeking to foster the professional and creative capacity of university staff. Finally, it had determined and explained the principal competencies teachers needed to deliver high-quality education grounded in social-constructivist and postmodernist philosophies, which encouraged student agency, social engagement, and classroom diversity.

Utami and Latiana (2018) had examined the perceptions of preschool teachers regarding their professional competence in the digital era, recognizing that teachers were expected to continuously enhance their knowledge, attitudes, and skills to remain professionally competent. Their study had aimed to explore teachers' views on professional competence and to identify how digital media was utilized in early childhood education. Through questionnaires and reflective essays collected from 59 Indonesian preschool teachers, the authors had found that although digital media was deemed necessary for delivering learning materials — particularly those that could not be directly presented to children, such as information about natural disasters, wild animals, or traditional dances — its use needed to align with children's needs and the resources of the institutions. The study had revealed that institutional resources were generally insufficient, with educators' skills still underdeveloped due to limited training opportunities and inadequate facilities. The researchers had recommended that teachers strengthen their abilities to use digital media in learning, while urging governments to expand access to teacher skill development in this area.

Kaiser et al. (2017) had explored recent research over the last decade on mathematics teachers' professional competencies, observing that diverse theoretical perspectives had emerged regarding their conceptualization and evaluation, namely cognitive versus situated approaches. Drawing on the IEA Teacher Education and Development Study in Mathematics (TEDS-M) and its follow-up TEDS-FU, they had compared these approaches, noting that TEDS-FU had enriched the cognitive-oriented framework with situated orientations such as the novice-expert model and the noticing concept to analyze classroom scenarios. They had reported that evaluation instruments were broadened through video vignettes to capture teachers' perception, interpretation, and decision-making competencies alongside traditional knowledge tests. Their discussion had highlighted the strengths and limitations of each theoretical framework and the resulting evaluation methods, while connecting TEDS-FU with TEDS-M to provide deeper insights into the structure and development of mathematics

teachers' professional competencies and their ties to teaching practice. Their analyses had suggested that both cognitive and situated approaches were necessary for a full description of professional competencies, and these approaches could be productively integrated. They had concluded by outlining future research directions aimed at even closer alignment with real classroom situations.

Kurnia Irmawati et al. (2017) had aimed to examine the various forms of professional development activities carried out by Indonesian professional English teachers to enhance their pedagogical competence in teaching implementation, as well as to identify how these activities contributed to their competence development. They had employed a qualitative approach in two phases: subject selection and the investigation of professional development efforts related to pedagogical competence. The criteria for selecting the subjects had reflected the four competencies required of professional teachers, namely personal, social, pedagogical, and professional competence. Data collection had been undertaken using questionnaires, interview guides, and observation sheets, involving four EFL teachers from Malang city, Malang Regency, and Batu town. Their findings had revealed that the professional development activities included engaging in discussions with colleagues, joining teacher association forums, attending seminars and workshops, enrolling in courses, conducting research, reading relevant materials, surfing the internet, and participating in team teaching. The teachers' learning methods had encompassed reflection, exchanging feedback, discussion, expanding knowledge, researching, and solving problems. In view of this study's limitations, the authors had recommended that future researchers explore further aspects of pedagogical competence development, especially those concerning teaching preparation and the evaluation of students' learning.

3. FINDINGS FROM EXISTING REVIEWS

Author(s) & Year	Methodology	Objective	Findings
Rofi'i et al. (2023)	Qualitative case study; structured interviews and document analysis	To improve teachers' professional competence in integrating technology	Teachers initially lacked confidence and skills in tech integration; professional development, peer coaching, and resources enhanced competencies and student motivation/outcomes.
Hammer & Ufer (2023)	Cross-sectional study assessing knowledge and planning processes	To assess teachers' professional competence in task selection and lesson planning in fraction learning	Professional knowledge linked to quality planning processes; noticing and reasoning during task analysis explained differences in planning quality.
Nurdiansyah et al. (2023)	Qualitative descriptive; interviews, observations, documentation; Miles & Huberman analysis	To examine elementary teachers' professional competence in online thematic learning	Teachers showed strong competence in subject matter, creativity, ICT use, and ongoing growth for effective online thematic learning.

Yang & Kaiser (2022)	Literature review	To summarize teacher competence concepts and impacts in mathematics education	Teacher competence includes knowledge, attitudes, and situation-specific skills; empirical studies show competence influences instructional quality and student achievement.
Lorensius et al. (2022)	Qualitative case study; observations and interviews; manifest analysis	To analyze academic supervision's role in enhancing teacher competence	Supervision by principals guided and motivated teachers; reflective practice and peer input improved competence and student outcomes.
Antera (2021)	Conceptual analysis method (CAM); systematic literature review	To clarify definitions and conceptions of professional competence among vocational teachers	Few studies clearly defined competence; consensus on its situated, developmental, and action-linked nature; recommended critical discussion to avoid confusion.
Toom et al. (2021)	Literature review and conceptual analysis	To explore how teachers develop professional competencies and their learning agency	Identified a research gap on how competencies develop; emphasized the importance of professional agency and features of teacher education fostering competence and agency.
Apriliyanti (2020)	Observational case study; interviews with 5 teachers	To investigate the role of professional development in enhancing teacher competencies	Program strengthened pedagogic and professional competence; barriers included adopting innovative methods; professional learning development seen as promising.
Siri et al. (2020)	Quantitative; survey of 277 teachers; SmartPLS analysis	To examine effects of teacher competence and commitment on performance	Teacher competence and commitment positively influenced performance; commitment mediated competence and performance relationship.
Ana et al. (2020)	Quantitative; survey of 13 policymakers	To analyze vocational teachers' required competencies in Industry 4.0 era	Priority competencies included pedagogical, social, personality, and professional; emphasized student understanding and ICT-enhanced communication.
Sorge, Stender & Neumann (2019)	Mixed methods; paper-pencil tests, vignettes, questionnaires	To reinterpret secondary science teachers' professional competence through Refined Consensus Model	Development of collective pedagogical content knowledge influenced by wider knowledge bases and motivational factors; competence progression linked to knowledge exchange.

Smolikevych (2019)	Qualitative analysis; review of pedagogical skills and teaching environment	To identify competencies needed for high-quality higher education teaching	Emphasized teaching, research, and professional growth; core competencies aligned with social-constructivist/postmodernist philosophies encouraging agency and engagement.
Utami & Latiana (2018)	Quantitative and qualitative; questionnaires and essays from 59 preschool teachers	To explore preschool teachers' perceptions of professional competence in digital era	Teachers acknowledged need for digital media use but faced insufficient resources and training; recommended enhanced training and resource access.
Kaiser et al. (2017)	Mixed methods; TEDS-M and TEDS-FU studies; video vignettes and tests	To compare cognitive and situated approaches to math teacher competencies	Both cognitive and situated approaches necessary; evaluation instruments broadened; integration provided deeper insight into competence structure and development.
Kurnia Irmawati et al. (2017)	Qualitative; questionnaires, interviews, observations with 4 EFL teachers	To investigate professional development activities enhancing pedagogical competence	Teachers engaged in discussions, seminars, research, and reflection; professional development improved competence but further study on teaching preparation recommended.

4. FINDINGS AND CONCLUSION

Findings: The study reveals that the evolving educational paradigm shaped by globalization, technological advancement, and shifting societal demands has significantly expanded the scope of teachers' professional competencies. Beyond traditional subject expertise, teachers must now demonstrate advanced pedagogical skills that foster critical thinking, creativity, and learner autonomy, alongside cultural responsiveness and emotional intelligence. The rise of blended and online learning environments has heightened the need for digital literacy and the ability to create engaging, inclusive virtual spaces. Teachers are challenged to address the digital divide, diverse student needs, and social-emotional well-being, requiring continuous professional growth and adaptability. This holistic skill set enables educators to design personalized learning experiences, integrate technology effectively, and cultivate safe, equitable classrooms that promote both academic success and student well-being [12-15].

Conclusion: This study underscores that teacher professional competencies are being fundamentally reconceptualized to meet the complex demands of modern education. Effective educators must embrace lifelong learning, reflective practice, and ethical commitment while adapting to dynamic instructional contexts shaped by technology and diversity. Addressing persistent challenges such as equity gaps and mental health requires systemic support and targeted capacity-building initiatives. Through aligning teacher preparation and professional development with these expanded

competencies, education systems can empower teachers as agents of meaningful transformation, capable of guiding students to thrive in an interconnected, rapidly changing world. Ultimately, investing in teacher competencies is crucial for realizing inclusive, innovative, and future-ready learning environments.

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