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TEACHING STRATEGIES AND PRACTICES FOR ENHANCING TEACHER COMPETENCE: A TIME- STRUCTURED REVIEW

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Abstract:

This chronological literature review explores the evolution of research on *Teaching Strategies and Practices for Enhancing Teacher Competence*, aiming to identify key trends and developmental patterns over time. Despite growing interest, existing studies remain fragmented, limiting a comprehensive understanding of how teaching strategies contribute to teacher competence. A systematic advanced search was conducted using the Scopus database with the main keywords teaching practices, teaching strategies, and teacher competence. Following a rigorous screening process, 97 high-quality journal articles were selected for analysis. The studies were categorised into four phases: Foundational Stage (2001–2013), Development and Consolidation Stage (2014–2019), Expansion and Acceleration Stage (2020–2023), and Rapid Growth and Intensification Stage (2024–2026). The findings reveal a clear progression in publication trends, methodological refinement, and increasing emphasis on digital pedagogy and competency-based approaches. This review highlights the growing maturity of the field and the value of chronological analysis in understanding research development.

Keyword:

Teacher Competence; Teaching Practices; Teaching Strategies



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Introduction

Teacher competence is widely understood as a dynamic integration of knowledge, skills, and attitudes that enables high-quality instruction and professional decision-making in real classrooms (Moriera et al., 2022; Singh, 2023; “Trends of Competencies in Teacher Education from 2015 to 2020: A Systematic Review Analysis,” 2022). It includes pedagogical, professional, personal, social, technological, and cultural dimensions, all of which shape teachers’ ability to plan, deliver, and assess learning effectively (Bakhronova, 2025; Moriera et al., 2022; Murkatik et al., 2020; Yulita et al., 2025). Research shows that competent teachers are central to student achievement, character formation, and readiness for 21st-century demands, making the continuous enhancement of teaching practices a key priority for education systems worldwide (Kim et al., 2019; Murkatik et al., 2020; Singh, 2023; Surtini & Muhtar, 2024). In this context, teaching practices are not just routines but deliberate, evidence-based actions that develop and express teacher competence in everyday instruction (Abdivalieva & Ogli, 2025; Channa et al., 2024; Qadrianty et al., 2024).

A growing body of literature highlights specific practices that strengthen competence across a teacher’s career. These include ongoing professional development through workshops, mentoring, collaborative learning communities, and reflective practice, which refine pedagogical skills and support lifelong learning (Adhikari & Budhathoki, 2025; Dignath, 2021; Kim et al., 2019; Kurgambekov et al., 2025; Singh, 2023; Yulita et al., 2025). Classroom embedded strategies such as student centred and inquiry-based instruction, differentiated teaching, effective classroom management and the meaningful integration of technology directly build pedagogical and professional competence while improving student engagement and outcomes (Abdivalieva & Ogli, 2025; Akhter & Salamat, 2025; Ampatua & Basmayor, 2025; Kim et al., 2019; Nasution & Riski, 2024; Surtini & Muhtar, 2024). Teaching practicum and real-world classroom experiences are especially important for preservice teachers, helping them bridge theory and practice, develop self-efficacy, and form a professional identity (Akhter & Salamat, 2025; Kurgambekov et al., 2025; “Trends of Competencies in Teacher Education from 2015 to 2020: A Systematic Review Analysis,” 2022). At the same time, newer expectations around cultural competence, inclusion, character education, and 21st-century skills demand that teachers continuously adapt their practices to diverse learners and rapidly changing educational contexts (Bakhronova, 2025; Kim et al., 2019; Moriera et al., 2022; Surtini & Muhtar, 2024; Zulkarnain et al., 2025). Together, these strands position teaching practices as the primary vehicle for enhancing and sustaining teacher competence. Teacher competence develops through intentional, research-informed teaching practices that connect theory, classroom experience, and continuous professional growth. By focusing on pedagogical skill, reflective development, technology use, and responsiveness to diverse learners, educators can systematically enhance their competence and, in turn, improve student learning and well-being.

Literature Review

Teacher competence is a cornerstone of educational success, influencing both instructional quality and student outcomes. Research highlights that teacher competence encompasses a range of skills, including pedagogical content knowledge, self-regulation, and professional beliefs, all of which significantly impact classroom instruction and student achievement (Fauth et al., 2019; Kunter et al., 2013). For instance, teachers with strong pedagogical content knowledge and enthusiasm for teaching tend to create higher-quality instructional environments, which in turn foster better student outcomes (Kunter et al., 2013). Additionally, teacher competence is not static; it evolves through professional development, which is critical for adapting to diverse classroom needs and modern educational demands (Rukajat et al., 2024; Suyitno, 2026). Digital competence, in particular has emerged as a vital component, enabling teachers to integrate technology effectively into their teaching practices, thereby enhancing both their professional growth and student engagement (Luo et al., 2025; Suyitno, 2026).

Effective teaching strategies are integral to developing teacher competence and improving student learning. Adaptive instruction, which tailors teaching to individual student needs, and strategies that stimulate engagement, such as fostering reading enjoyment, have been shown to significantly enhance student performance (Chen & Li, 2025). Moreover, evidence-based practices, such as the use of formative assessments and data-driven decision-making, are essential for refining instructional methods and ensuring their effectiveness (Didion, 2025; Lekwa & Reddy, 2020). Teachers who employ these strategies not only improve their instructional quality but also build their confidence and self-efficacy, which are critical for sustained professional growth (Ibrahim et al., 2019; Marinšek et al., 2026). Furthermore, innovative approaches like video-based instructional resources combined with expert consultations have proven effective in enhancing teachers' instructional competence and adaptability (Marinšek et al., 2026).

Challenges in implementing teaching strategies often stem from gaps in teacher preparation and professional development. Teachers frequently face difficulties in aligning their instructional methods with competence-based curricula, particularly in resource-constrained environments (Msuya & Abdala, 2025; Nyoni, 2018). Insufficient teaching materials, lack of in-service training, and unpreparedness are common barriers that hinder the effective application of teaching strategies (Msuya & Abdala, 2025; Nyoni, 2018). Additionally, the diversity of student needs, including those in inclusive education settings, requires teachers to possess advanced pedagogical skills and the ability to modify their teaching approaches (Mumpuniarti et al., 2020). Addressing these challenges necessitates targeted interventions, such as regular training programs, access to teaching resources, and the development of teacher guidebooks that provide practical strategies for overcoming instructional difficulties (Anwas et al., 2024; Nyoni, 2018).

Finally, fostering teacher competence requires a systemic approach that integrates professional development, supportive leadership, and evidence-based practices. School leaders play a pivotal role in enhancing teacher competence by creating conducive environments for professional growth, such as organizing training sessions, promoting collaborative learning, and providing mentorship (Al Shebli, 2023; Wulandari & Arifin, 2020). Moreover, the integration of modern pedagogical approaches with technology has been identified as a key strategy for equipping teachers with the skills needed to navigate the complexities of contemporary classrooms (Podolsky et al., 2017; Rukajat et al., 2024). By aligning teacher

preparation programs with evidence-based practices and addressing the unique challenges faced by educators, schools can ensure the continuous development of teacher competence, ultimately leading to improved student outcomes (Cook, 2015; Podolsky et al., 2017).

In conclusion, improving teacher competence involves effective instructional practices, strong professional development, and systemic support. By addressing issues and using evidence-based strategies, educators may build dynamic, inclusive learning environments for instructors and students. This review article outline has three parts: Section 1 covers introduction and associated research, while Section 2 covers review data. Section 3 discusses this study's findings.

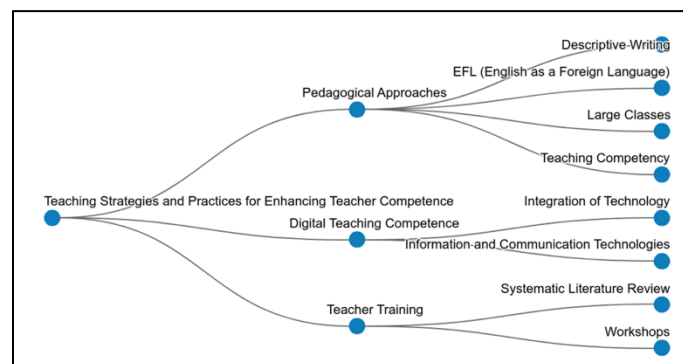


Figure 1: Mapping Concept Map for Literature Study

Methodology

Data Collection

Teacher competency is crucial to student learning and institutional success due to the complexity of educational institutions and the demand for high-quality teaching. This chronological review, *Teaching Strategies and Practices for Enhancing Teacher Competence*, examines the development of scholarly discourse on instructional strategies and pedagogical practices that improve teacher competence. This evaluation uses a structured analysis of Scopus-indexed peer-reviewed papers in education and allied fields due to its wide coverage of high-impact journals. A carefully prepared search string containing relevant terms (e.g., “teaching strategies,” “instructional practices,” and “teacher competence”) was utilized to get a concentrated but representative corpus of literature in one step. Inclusion and exclusion criteria were then employed to preserve only high-quality, relevant papers, improving review coherence and analytical depth. This methodological technique allows chronological mapping of field research trends, theme changes, and methodological adjustments.

The reliability, validity, and interpretability of chronological review study conclusions depend on a rigorous and systematic data collection process. High-quality academic research relies on clearly recorded and consistent systematic search processes to reduce selection bias and improve review replicability (Moher et al., 2009). Using a recognized database like Scopus ensures that the included research meet academic quality and peer review requirements, strengthening the review's validity. Analyzing trends over time requires methodological rigor because data collecting errors might affect study paths and lead to incorrect conclusions. This review synthesizes available knowledge and helps explain how teaching tactics and practices have changed to meet evolving educational needs by using an organized and methodical

approach. This helps identify research gaps, emerging themes, and future directions, advancing teacher competence development theory and practice.

This chronological review used Scopus to look for high-quality, peer-reviewed literature on Teaching Strategies and Practices for Enhancing Teacher Competence. The search string was constructed using the Boolean operator AND to connect the review's three core conceptual domains pedagogical practice, instructional strategy, and teacher competence and the operator OR within each domain to capture synonymous and conceptually related terms, improving retrieval sensitivity and breadth. The search included teaching practices, instructional practices, and pedagogical practices; teaching strategies, instructional strategies, learning strategies, and educational strategies; and teacher competence, effectiveness, quality, skills, and training. The search was limited to social sciences, journal articles, English-language publications, final-stage records, and journal sources to increase academic relevance and disciplinary focus. The review analyzed papers from 2000 to 2026 to identify long-term trends, shifts in emphasis, and new trajectories in teacher competency enhancement scholarship. This structured search yielded 189 items, providing enough evidence for chronological analysis. After relevance, scope alignment and publishing criteria screening, 92 records were eliminated and leaving 97 studies for final analysis. The elimination of records after screening was justified to eliminate thematic relevance duplicates, off-topic research and articles that did not directly address teaching techniques, practices, and teacher competency. High-impact review writing requires rigorous filtering to improve the precision, credibility and interpretive validity of the final corpus and ensure that the analysis is based on a coherent and methodologically defensible body of evidence that can support reliable conclusions about research trends over time. Figure 2 illustrates the flow diagram of the search strategy employed in this study, outlining the systematic process of literature identification, screening, and selection.

Data Clustering

In a chronological review of *Teaching Strategies and Practices for Enhancing Teacher Competence*, the application of data clustering based on publication year and volume constitutes a critical analytical step for transforming raw bibliometric outputs into meaningful and interpretable patterns of scholarly development. Given that the dataset was systematically retrieved from a reputable and comprehensive source, namely the Scopus database, using carefully constructed keywords and advanced search strategies, the resulting corpus provides a reliable foundation for longitudinal analysis. However, without structured grouping, the interpretation of year-by-year publication counts remains fragmented and limits the ability to discern broader trends. Clustering enables the aggregation of discrete data points into coherent temporal phases, thereby facilitating the identification of growth trajectories, periods of stagnation, and phases of rapid expansion within the research domain. This approach is particularly important in high-impact review studies, as it enhances analytical clarity by highlighting shifts in research intensity that may correspond to contextual developments such as policy changes, technological advancements, or evolving pedagogical paradigms. Furthermore, clustering supports comparative interpretation across time intervals, allowing for a more nuanced understanding of how scholarly attention to teaching strategies and practices has evolved in relation to teacher competence. By organizing publication data into meaningful groups, the review not only improves the readability and conceptual coherence of trend analysis but also strengthens the validity of inferences drawn regarding the maturation and future direction of the field.

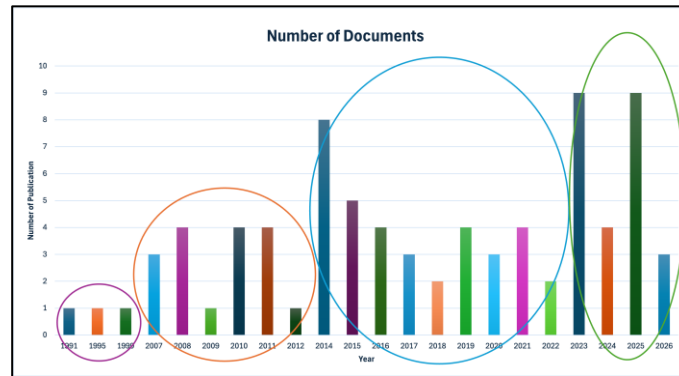


Figure 3: Number Of Documents Per Year

Figure 3 illustrates the annual distribution of publications on teaching strategies and teacher competence. Early years show minimal output, followed by gradual growth between 2008 and 2013. A marked increase appears from 2014 to 2023, culminating in a sharp surge during 2024 to 2025, indicating intensified research interest and field maturation trends. Based on the temporal distribution of publications, the evolution of research on Teaching Strategies and Practices for Enhancing Teacher Competence can be meaningfully classified into four distinct phases, reflecting shifts in research productivity and scholarly attention over time. The first phase, “Foundational Stage (2001-2013)”, is characterized by sporadic and low publication output (1-2 studies per year), indicating an emerging field where conceptual understanding and initial theoretical grounding were being established. The second phase, “Development and Consolidation Stage (2014-2019)”, demonstrates a gradual increase in research activity, with publications rising modestly (peaking at 4 in 2017), suggesting growing scholarly interest and early efforts to refine pedagogical frameworks and empirical approaches. The third phase, “Expansion and Acceleration Stage (2020-2023)”, reflects a notable surge in productivity (6-7 publications annually), likely influenced by global educational transformations, including digitalization and the shift toward innovative teaching strategies, which intensified research on teacher competence. Finally, the fourth phase, “Rapid Growth and Intensification Stage (2024-2026)”, exhibits a dramatic escalation, particularly in 2025 (37 publications), marking a significant maturation of the field and heightened academic focus on evidence-based teaching practices. This clustering is justified by clear inflection points in publication trends, enabling a structured interpretation of how the research domain has evolved from exploratory beginnings to a highly active and rapidly expanding field.

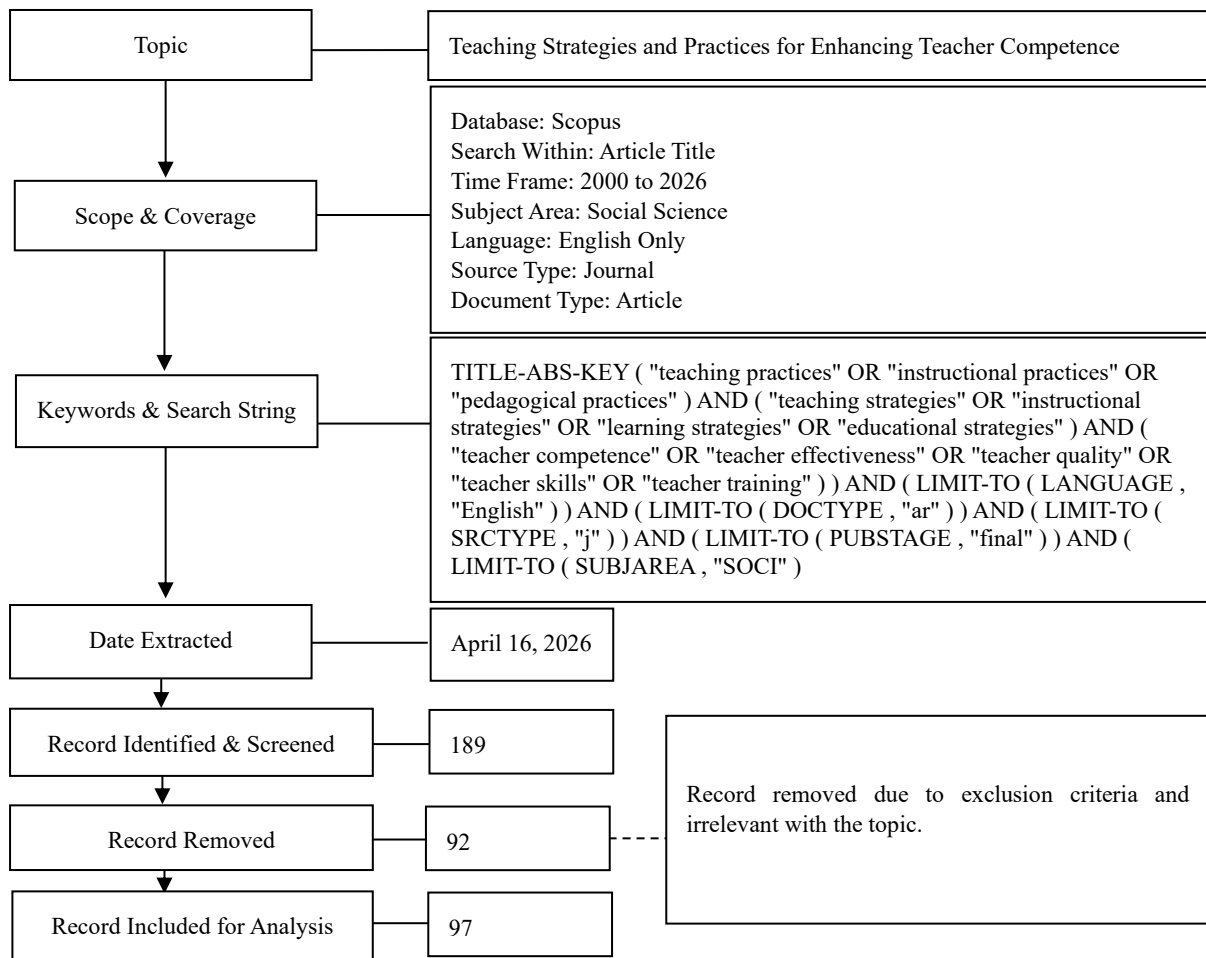


Figure 2: Flow Diagram of The Search Strategy.

Source: (Moher et al., 2009; Page et al., 2021)

Result and Discussion

Phase 1: Foundational Stage (2001-2013)

The field was founded by small but conceptually significant contributions that linked teacher competence with pedagogical responsiveness, reflective practice, and contextual adaptation in the Foundational Stage (2001–2013). Early formative years (2001–2005) focused less on standardized models of competence and more on practical teaching skills in various educational environments. Howard (2001) found that culturally relevant pedagogy, including holistic instruction, communicative forms that met learners' sociocultural expectations, and deliberate skill-building for academic success, was effective for African American students. This shows that instructor competence was now defined as adapting pedagogy to learner background rather than technical instructional proficiency. Different but complimentary, (Borghi et al., 2001) found that in-service teacher education in physics was more meaningful when teachers critically reexamined subject content and collectively related disciplinary knowledge to classroom implementation. The reported use of ongoing electronic discussion about student responses and instructional effectiveness suggests that reflective dialogue and subject-specific

professional learning strengthened competence development more than isolated training exposure.

In the same early period, teacher competency expanded to include selection, inclusion, and complex school readiness. (Ebmeier & Ng, 2005) found significant associations between a computer-based adaptive interview instrument and administrator ratings of teacher effectiveness in urban districts, suggesting that contextual teaching demands can predict competence. This gave the discipline an evaluative and predictive dimension, making competence a measurable professional disposition relevant to demanding educational situations as well as classroom enactment. In parallel, CLASS workshops improved teacher readiness for inclusive science education, familiarity with strategies and resources, and competence to alter activities for students with disabilities (Kirch et al., 2005) The discussion suggested that inclusive competence required more than favorable attitudes—it required specific pedagogical adaptations, awareness of disability-related needs, and confidence in constructing accessible learning experiences. The 2001–2005 studies show a field continuing under exploration but with three ongoing concerns: cultural responsiveness, reflective professional development, and the need for competency frameworks that account for varied teaching situations.

During the transitional consolidation era (2011–2012), specialized teaching environments and pedagogical impediments became more apparent. (Bedoin, 2011) showed that English teachers for deaf and hard-of-hearing students used adapted language and written and visual assistance to make lessons accessible. Instructional flexibility and multimodal content mediation were linked to competency in this domain. The survey also noted insufficient teacher qualifications and the need for improved preparation, showing that competence development was being considered in terms of both successful classroom practices and systemic flaws in professional training. While presented as a perspective-based discussion, (Jensen, 2011) reinforced this line of thinking by emphasizing the practical importance of pedagogical preparation for teaching effectiveness, especially in sectors where such preparation had not been expected. This supported the claim that subject mastery alone was insufficient for quality training. A similar concern emerged in (Luschei & Zubaidah, 2012), rural Indonesian teachers viewed training as useful but insufficient for managing big multigrade classrooms, and pedagogical diversity across schools suggested uneven access to essential assistance. Further discussion of contract teachers revealed that staffing patterns created new competence needs, especially for rural beginner teachers. Across this research, teacher competency was increasingly seen as context-dependent, with effective techniques needed to address disability, rurality, multilingualism, and uneven professional support structures.

In the late foundational period (2013), the field began to analyze teacher competence, instructional effects, methodological caution and technology-related pedagogical integration. (Guarino et al., 2013) found that manipulatives, worksheets, chalkboard problem-solving, explanation of techniques, and textbook-based work improved early mathematics proficiency at different grade levels. The study also noted that modeling and estimating choices affected conclusions on effective teaching, which made the literature more methodologically self-aware. Thus, competence became a construct whose effects needed rigorous analysis rather than just a descriptive feature of competent teachers. For large-scale one-to-one technology integration in Chile, (Claro et al., 2013) observed that the resource was used intermittently for information search, drill, and practice, with no pedagogical innovation in classroom observations. Limited use was attributed to poor teacher training, lack of preparation time, and

insufficient technical and pedagogical assistance. This is crucial because it reveals that teacher competency relies on the ability to translate tools into pedagogically intentional practice, not access to educational technology. The 2013 studies suggest that the fundamental stage was conceptually widening, where competency was tested through student outcomes, research design quality, and implementation conditions for innovation.

The study on competence changed from descriptive accounts of successful and context-sensitive education to adaptive practice, pedagogical preparation, contextual awareness, and evidence-informed implementation from 2001 to 2013. Early studies focused on culturally appropriate teaching, collaborative reflection, and inclusion-oriented practice; later studies examined specific learner needs, training gaps, rural and institutional barriers, and resource conversion. Competence was rarely recognized as universal. Instead, the abstracts show teacher knowledge, student characteristics, instructional setting, and professional growth encourage competency. Contextualized pedagogy, training quality, inclusive practice, instructional methods, and measurable educational results were all introduced in the Foundational Stage.

Phase 2: Development and Consolidation Stage (2014–2019)

In the Development and Consolidation Stage (2014–2019), research shifts from broad teacher development to a more systematic study of the conditions that promote, constrain, and refine competent teaching. Early consolidation (2014–2016), intensity and diversification (2017), and applied refinement (2018–2019) are major temporal groups. The literature has focused on translating training into classroom practice, the gap between pedagogical purpose and implementation, and how technology, differentiation, and context-sensitive support promote teacher competency in these sub-periods. This level's articles emphasize teacher learning operationalization, methodological diversity, and institutional coverage more than the fundamental stage.

Results from the early consolidation era (2014–2016) focused on professional development and classroom techniques. Professional development and graduate teaching training were favorably related with student-centered behaviors among engineering professors (Lattuca et al., 2014). Departmental background was only moderately associated, showing that direct development initiatives had more practical impact than institutional climate. This discovery was crucial because it turned the discussion from generic endorsement of professional learning to proof that specific training promotes active learning and precise feedback. Another study (McNeill & Kirk, 2014) found significant heterogeneity in spelling assessment and teaching procedures and a discrepancy between instructors' theoretical ideas and their evidence-based instructional practices. This gap was attributed to poor professional expertise and time restrictions, suggesting that pedagogical belief alone cannot guarantee teacher ability. According to (García-Valcárcel et al., 2014), instructors recognized the potential benefits of ICT for collaborative learning and skill development but also acknowledged practical challenges in its implementation in the classroom. These findings indicate that early in this stage, teacher competency was more seen as an enactment rather than an orientation or attitude. The early consolidation phase also emphasized teacher education structure and instructional design in competency creation. Preservice teachers, novice teachers, supervisors, and school leaders agreed that lesson planning with varied teaching strategies and school-university collaboration are important parts of teacher education (Sa & De Almeida, 2016) Classroom control, student attention, and learner motivation were also found to be lacking. This balance between strengths and deficits reveals that competence development was no longer considered

as a generic outcome of teacher education, but as a profile where specific talents were better supported. According to (Hastürk & Doğan, 2016), the triadic teaching strategy increases meaningful learning and enhances science teachers' ability to employ educational technologies. Internet-based inquiry, poster work, and small symposiums imply that competency is increasingly linked to active, multimodal, and technology-supported education. Thus, by the conclusion of this sub-period, the literature had approached teacher competency as a set of professional skills that included planning, technological integration, and classroom responsiveness.

In 2017, there were more studies and a greater focus on virtual environments, differentiated instruction, design-based learning, and ICT-supported innovation. Immersive virtual environments helped preservice teachers enhance technology abilities and see teaching practices positively (Badilla Quintana et al., 2017). Peer assessment and role-play improved performance, but hardware and communication issues persisted. This shows that digital competence development required pedagogical challenge and infrastructure reliability. (Gaitas & Alves Martins, 2017) observed that most domains, including activities and materials, assessment, management, and planning, were challenging to execute differentiated teaching, whereas classroom environment was easier. The strong relationship between activities/materials and assessment suggests that differentiation needed coordinated educational judgments. This matters because differentiated education had by then become a practical challenge that required greater preparation and ongoing professional development.

In 2017, several studies confirmed that teacher competence required a balance between facilitation, explicit teaching, and supported creativity. (Van Breukelen et al., 2017) observed medium overall learning benefits in design-based learning contexts, but task-specific increases were strongest. Feedback and cooperation support dominated instructor interventions, but direct scientific idea explanation was rare. However, students wanted clear science education, therefore design-based pedagogies needed more conceptual explanation, decontextualization, and recontextualization to increase understanding. This research adds richness to the area by indicating that student-centered competence requires careful explicit education. After a teacher training course, participating teachers moved from ICT adoption to adaptation, using flipped classrooms and collaborative work (Pombo et al., 2017). Classroom observation validated the idea that adequate support mechanisms increased technology innovation and digital literacy. The 2017 studies showed that competence was increasingly defined by the teacher's ability to integrate innovation with instructional clarity, learner needs, and persistent support systems.

The 2018–2019 applied refinement period shows a trend toward analyzing how preparation and pedagogical research affect teaching practice. (Tygret, 2018) revealed that first-year teachers felt prepared and used good teaching tactics, but they needed more training in different learners and curriculum implementation. Teacher confidence and educational impact were used to evaluate early-career competence, and student progress was a huge success. (Solbes J.; et al., 2018) found significant differences between scientific education instructors with active training and those with conventional training. Strategies, use of new materials, classroom management, and ICT use varied greatly in classroom observations and interviews, whereas infrequent short courses had minimal impact. This is significant because it implies that training intensity and quality, not participation, shape professional competence. Thus, by 2018, the literature had grown more explicit in distinguishing superficial development activities from deeper learning that changes classroom practice.

In 2019, introductory teacher education competence literature is more sophisticated and practice oriented. In primary teacher education, university instructors use many didactic methods to teach reading and literature (Álvarez-Álvarez & Pascual-Díez, 2019). These innovative, practical, and emotive exercises focused on academic, teaching, and reading skills. Discussion implies that prospective teachers' education increasingly emphasizes conceptual and practical teaching skills and mediation and classroom application attitudes. With the 2018 studies, this final stage shows that the field has begun to consolidate around a more integrated model of competence, where sustained training, context-responsive implementation, diversified strategy use, and explicit links between preparation and classroom realities support effective teaching. After locating good professional development and innovation opportunities, the Development and Consolidation Stage evaluate how they improve teaching methods.

Phase 3: Expansion and Acceleration Stage (2020–2023)

The Expansion and Acceleration Stage (2020-2023) involve initial expansion (2020), methodological diversification and educational adaptation (2021-2022), and strategic consolidation (2023). Abstract findings and discussion changes support this classification. Conceptual transformation, learner-centered practice, project-based learning, and training intervention validation characterized 2020 studies. Digital pedagogy, flipped learning, e-learning preparation, active learning competencies, practicum experiences, personalized instruction, and technology-supported teacher training were covered more in 2021-2022. By 2023, efficacy, professional development hurdles, and teacher competence strategies were discussed. Throughout the period, teacher competency was defined as pedagogical understanding, digital readiness, contextual adaptation, reflective capacity, and professional support systems.

The initial expansion period (2020) broadened the field from conventional teaching method descriptions to more dynamic pedagogical growth interpretations. (Yang & Kuo, 2020) found that CALL training students created new teaching practices through conceptual change, collaborative learning, and role switching amongst teacher, designer, learner, and facilitator. In technology-mediated language teaching, competence development probably relied more on experiential engagement and viewpoint change than technical exposure. In a related but broader pedagogical context, (Viro et al., 2020) found that teachers valued project-based learning for content understanding, teamwork, and linking theory with practice, but limited resources, exemplars, training needs, and time limited implementation. Positive perception of an educational model did not guarantee smooth classroom implementation. (Rodríguez-Medina et al., 2020) found that an intervention program for geography and history trainee instructors led to improvements in methodology, motivation, satisfaction, and perception. Group work, digital resources, and primary source utilization showed significant benefits. Active learning tactics worked better in organized and validated training schemes, according to this study.

Other 2020 studies focused on pedagogical self-regulation, learner-centered teaching problems, and relational teacher effectiveness in addition to instructional design. According to (Filice et al., 2020), clinical teacher efficacy in nursing depends on student self-regulated learning and the teacher's ability to be both a learner and a teacher. The model-based debate helped frame competence as an ongoing pedagogical regulation process rather than a static set of teaching acts. (du Plessis, 2020) observed that student teachers had poor grasp of learner-centred teaching and had major implementation issues, recommending lecturer direction, reflection, and accountable mentor intervention. This shows that policy-level acceptance of learner-

centered education was insufficient without better teacher development pedagogy. The Teacher Accompaniment Scale (Baring et al., 2020) showed two latent dimensions of teacher accompaniment, support and stress, and argued that teacher personality and behavior should be considered alongside strategies and methods when discussing teacher effectiveness. The 2020 findings suggest that strategy-focused analysis was giving way to relational, reflective, and contextual competence.

Methodological diversification and instructional adaptation occurred in 2021–2022 as studies increased in number and varied in context, technique, and competence domains. Flipped learning, project-based learning, gamification, and numerous features of mathematics teaching practice and teacher training were positively associated in 2021 (Hosseini-Mohand et al., 2021) Online interaction, involvement, cooperation, and digital software use shaped these active approaches. This reveals that internet communication and collaborative professional culture increasingly correlated with mathematics teaching skill. Pre-service teachers teaching life skills had mentor support but struggled with curriculum implementation, classroom engagement, language use, and topic importance (Arasomwan & Mashiya, 2021) The discussion suggested curriculum reform, micro-teaching, and language preparation. (Orosz et al., 2021) found that Ecuadorian English teachers recognized the importance of English teaching and tried to meet professional demands, but they lacked knowledge to develop higher-order skills like creativity and critical thinking, had limited training opportunities, and had low student motivation These studies increasingly viewed competence as context-sensitive and depending on instructional preparation and institutional assistance.

Structured observation, e-learning preparation, active learning competency, and digital practicum experience are also prioritized in 2021. In early foreign language teaching, comprehensible input, communicative authenticity, negotiation of meaning, feedback, focus on form, and learner output are operationalized through the Teacher Input Observation Scheme for observation, training, and self-evaluation (Kersten, 2021). Language teachers must control verbal and nonverbal pedagogical behavior, according to the discussion. Computer use, internet use, perception, training experiences, school e-learning status, and perceived implications of e-learning all positively correlated with science teachers' readiness and motivation for e-learning in Fiji (Prasad et al., 2021) with perception and implications being strongest. Das Neves et al. (2021) recognized teamwork, empathy, feedback, ICT competence, contextual methodology selection, and creativity as critical skills for active learning in engineering education, with variation by gender, qualification status, and area. According to SAMR, Norwegian pre-service teachers had poor digital integration but indicated moderate to high satisfaction with digital practices during practicum (Jimarkon et al., 2021). These studies show that in 2021, competency was researched using quantitative indicators and multi-competence frameworks, notably in digital and active-learning environments.

Application, intervention, teacher knowledge, disciplinary context, individualized education, and pandemic-related technological development dominated the literature by 2022. A problematization-based training course changed teachers' perception of active methodologies from teaching techniques to ways of engaging with students' real-life problems and the teaching-learning process (Soares R.G.; et al., 2022). Teachers' conceptualization of active pedagogy matured. In a music teaching review, Valdebenito & Almonacid-Fierro, (2022) found that socioeconomic context, policy, initial preparation, and insufficient support shaped classroom musical interventions, while institutional purpose, professional development, and content and teaching skill preparedness determined teacher competence. Gamification and

multimedia resources motivated engagement and improved learning during music education student teacher training, provided that ICT use was supported by an appropriate pedagogic approach (Carrión Candell & Colmenero, 2022). These findings imply that competence development in 2022 was increasingly linked to innovation and instructional quality.

In 2022, more investigations confirmed that teachers' interpretations of learner diversity, scientific knowledge, and remote teaching settings affected competence enhancement. In mixed-ability classrooms, novice chemistry teachers used whole-class tactics, active engagement, engaging resources, and assessment practices, but seldom used formative assessment data to differentiate instruction (Salleh et al., 2022). The one-size-fits-all approach suggests starting teachers needed more responsive pedagogy training. (Tadielo et al., 2022) found that teachers valued an online neuroscience course for learning new skills and enhancing pedagogy, as well as the online format and technology. According to (Rodríguez Escobar et al., 2022), Chilean EFL teachers still prioritize British and American pronunciation models, despite acknowledging broader English varieties. However, they also viewed forced technology use during the pandemic as beneficial for student autonomy and metacognition. Two simultaneous developments formed the 2022 literature: growing acceptance of technology-supported learning and training, and persistent difficulty transitioning from generic innovation to completely adaptable and differentiated teaching practice.

The strategy consolidation phase (2023) emphasizes efficacy, values integration, and professional growth hurdles. In Christian schools, faith influenced course content more than instructional practices, while secondary teachers valued academic discipline but not theological tradition (Witwer, 2023) A partial instructional model is suggested by the debate of value-based schooling's competence frameworks' uneven distribution across curriculum and pedagogy. Universal Teacher–Child Interaction Training increased classroom management, educational practices, and student engagement (Rivas et al., 2023) This finding strengthens the claim that communication-focused intervention builds teacher competence by directly linking in-service training to teacher self-efficacy. Barriers to technology-based professional development were linked to the gap between information access and effective instructional technology use (Zhou & Eslami, 2023) Technology-literate teachers could incorporate digital knowledge into practice and motivate students better, while those with low digital literacy encountered technical issues that limited their teaching. The literature had grown more strategic, less descriptive, and more focused with skills maintenance across institutional and technical environments in this final cluster.

The 2020–2023 Expansion and Acceleration Stage studies show teacher competency expanding. Conceptual transformation, learner-centered teaching, project-based learning, intervention validation, and relational teacher conduct increased 2020 publications. Digital pedagogy, active learning, e-learning readiness, mixed-ability instruction, neuroscience-informed training, and gamified teacher education enhanced this trend in 2021–2022. The research also discovered barriers to curriculum implementation, technology use, and differentiated instruction. Efficacy building, value-informed teaching, and technology-based professional development were focused in 2023. Pedagogy, self-regulation, digital literacy, feedback capacity, contextual adaptation, and persistent professional development structures affect teacher effectiveness as exploratory expansion leads to a more integrated and strategic view of competence.

Phase 4: Rapid Growth and Intensification Stage (2024–2026)

The research can be divided into three relevant sub-phases: early intensification (2024), systemic expansion (2025), and reflective and inclusion-oriented continuance (2026). Clear shifts in publication volume and finding orientation justify this categorization. The 2024 studies focused on digital transformation, competency specification, motivation, and instructional environment reform. System-level professional development, inclusive teaching, lesson study, differentiated instruction, immersive and digital pedagogies, and context-responsive teacher growth were included in the bigger 2025 research. Although modest, the 2026 cluster suggests a more reflective and framework-based approach, particularly through self-observation, inclusive intents, and creativity-oriented teaching competency. Teacher competency was increasingly defined as digital readiness, adaptive strategy use, reflective judgment, inclusive capability, motivation, and institutional support throughout the period.

Competency structure and technologically assisted pedagogical transformation are prominent in early intensification (2024). In 2024, (Vičič Krabonja et al., 2024) showed that creative professional learning groups with formal structures and non-formal incentives promoted innovation, collective efficacy, and sustainable digital transformation beyond just exchanging good practices. This suggests that competence growth was seen as a systemic phenomenon rather than a teacher trait. (Katakara et al., 2024) found a substantial positive relationship between ICT use and student teachers' views of math lecturers' teaching tactics, showing that meaningful technology integration was closely linked to learners' perceptions of pedagogical quality. (Giler A.A. et al., 2024) found 198 competencies across 17 categories in mathematics teacher education in Ecuador, with mathematical knowledge appearing most often. Institutional variation showed that some programs prioritized content while others prioritized direct teaching practice. This is significant because competency frameworks become more explicit, distinct, and policy relevant.

Several other 2024 research confirmed pedagogical innovation and implementation gaps. Long-term professional development relationships with informal science organizations boosted teacher motivation and science pedagogy perspectives through contextual and collaborative learning (Slagus & Kelly, 2024). Career-oriented teaching improved biology students' self-regulation, particularly in decision-making, goal orientation, impulse control, and self-direction (Honra et al., 2024), and suggested that teacher training should support more concrete and problem-based task design. Science instructors utilized inquiry-based and problem-based tactics to integrate STEM, but they focused more on skills and real-life applications than on integrating concepts across disciplines, and many still lacked confidence and needed STEM expert guidance (Ismail et al., 2024). Competency-based assessment in Vietnamese EFL settings had transformative potential for engagement, autonomy, critical thinking, and problem solving, but lack of resources, practical training, and individualized feedback limited its implementation (Yen & Thao, 2024). These data reveal that 2024 saw a conflict between innovation and insufficient practical support structures.

In 2024, the conversation expanded to include emotive, environmental, and technology-acceptance teaching competency. (Murphy et al., 2024) showed that active learning classrooms worked best when expectations matched physical environment affordances, with low-tech rooms facilitating interaction but retrofitting facilities imposing physical barriers like shadow zones. EFL teachers' emotionality predicted a large amount of academic engagement and motivation (Zhao, 2024), demonstrating that emotional capacity was a major predictor of

competence-related teaching performance. Solid teacher preparation and modern technologies were key to improve middle school instruction (Chiqui Llangari et al., 2024). According to (Huang & Musah, 2024), augmented reality improved creativity, student conduct, and instructional tactics. Teacher competency mitigated these effects, while technological acceptability mediated them. These studies reveal that early intensification broadened competence to include strategy selection, teacher mood, learning environment design, and mediated technological acceptance.

With a focus on professional learning systems, inclusivity, active pedagogies, reflective collaboration, and context-sensitive teacher growth, the systemic expansion era (2025) is more extensive. (Corbacho-Cuello et al., 2025) found that prospective teachers with a stronger interest in science and plants learned more and responded better to botanical inquiry trails, suggesting that experiential learning in teacher education improved environmental literacy and inquiry-based approaches. A systematic review by (Bernal M.G. & Delgado V.M.P., 2025), stressed the relevance of collaborative, technical, and creative tactics for meaningful classroom interaction and the need for improved institutional support and teacher preparation. (MacCallum, 2025) proposed the TPAC 2K paradigm for integrating computational thinking across subjects, which requires professional growth, scaffolding, and interdisciplinary collaboration. Some teachers demonstrated high self-efficacy while others were unprepared and unaware of gender-responsive pedagogy (Rguibi et al., 2025), emphasizing the necessity for focused professional development. These data imply 2025 decisively viewed teacher competence as institutional, ethical, and cross-curricular.

Another 2025 trend is the fast increase of reflective, collaborative, and practice-based professional development research. The study by (İleritürk & Kınca, 2025) indicated that lesson study enhanced English teachers' planning, diversity, relevance, self-evaluation, and peer learning, while maintaining some traditional practices and emotional objectives. Similar to (Morales-Maure et al., 2025) lesson study and didactic appropriateness criteria increased instructional design, mathematical discourse, adaptive teaching, confidence, and sustained peer collaboration. (Gök & Michel, 2025) found that lesson study in EAP contexts made teachers more aware of task clarity, student proficiency gaps, and vulnerability issues, moving focus from teaching method to student needs and emotional realities. (Golightly, 2025) showed that geography teachers' self-directed learning, professional development, and learner-centered instruction are positively correlated. These findings suggest that competency is increasingly linked to cycles of reflection, collaboration, and pedagogical modification rather than one-time instruction.

Increased inclusive and varied teaching research is another 2025 trend. Extended reality simulation improved instructors' comprehension of visual impairment, empathy, and respect for adaptation techniques (Barbieri et al., 2025), showing experiential immersion can improve inclusive readiness. According to (Chander & Arora, 2025), mixed-ability science teachers employed basic digital tools and informal diagnostic observations, but most lacked training and advanced infrastructure. Diagnostic awareness was associated to more significant digital adaption. (Nwosu et al., 2025) found that Nigerian student teachers found managing challenging behaviour in inclusive classrooms difficult and needed better preparation, teacher trainers, and school support, even though placements increased acceptance of special needs students. Differentiated instruction was positively viewed and connected to teacher readiness (Nketsia et al., 2025), emphasizing the significance of targeted preparation. According to (Fierro-Saldaña & Treviño-Villarreal, 2025), inclusive physical education initiatives must align

with the system and context, emphasizing teacher dedication, communication, community involvement, and infrastructure. These findings suggest that inclusion became a fundamental criterion of teacher competence in 2025.

Studies from 2025 show that digital, integrated, and innovative pedagogies are intensifying. (Borrás-Gené & Díez, 2025) found that incorporating flipped classrooms with digital badges improved motivation, engagement, academic performance, and perceived learning progress in future teachers, indicating that gamified design can enhance learning outcomes and digital competence. Open distance learning helped ESL teachers integrate theory with classroom experience and improve teaching practices, but infrastructure and face-to-face interaction remained issues (Ooi & Othman, 2025). (Carvalho et al., 2025) found that teachers liked immersive web environments, but implementation depended on instructional design, training, and institutional support, not technology. TPACK-informed lesson design improved tutors' open-ended questioning, group structuring, and reasoning-oriented instruction (Habiyaremye et al., 2025). Despite infrastructure issues, township schoolteachers supported computational thinking via stepwise thinking, real-world examples, peer-assisted learning, and practical exercises (Tshidi, 2025). These investigations show that in 2025, digital pedagogy was addressed more for instructional alignment, teacher preparation, and contextual practicality than novelty.

In 2025, studies expanded on identity, beliefs, critical thinking, creativity, and complicated reasoning. (Ling & Huang, 2025) found that a rookie L2 teacher's progressive and reflective identity influenced pedagogical decisions, demonstrating that professional self-image filters competence. (Perdomo-López et al., 2025) revealed that key ideas regarding disciplinary knowledge, vocation, and practical training remained mostly constant over initial teacher education, raising questions about how much existing programs affect professional belief systems. Turkish teachers used explicit strategies and Vietnamese teachers used implicit ones to teach critical thinking, while both contexts were pressured by exams, limited resources, and AI (Orhan & Le, 2025). (Ling & Huang, 2025) found that project-based instruction increased pre-service early childhood teachers' creativity across all subdimensions. Neuroeducation can improve individualized, inclusive, and emotionally responsive learning settings, but it requires interdisciplinary collaboration and purposeful teacher education (Qafa et al., 2025). Despite uneven institutional integration, (Ramírez-Montoya et al., 2025) found that teachers were already using active learning strategies linked to critical, scientific, systematic, and innovative reasoning in higher education institutions, promoting complex thinking. This research reveals that by 2025, competency was closely linked to professional cognition, beliefs, identity, and reasoning-oriented pedagogy.

Although the dataset has fewer studies from the reflective and inclusion-oriented continuing phase (2026), it emphasizes organized self-evaluation and inclusive practice's internal mechanisms. Creative gifted education self-observation measures and rubrics were designed for preparation, execution, and evaluation (Yoon & Lee, 2026). The framework encouraged reflective practice, instructional development, and student diversity understanding while promoting differentiated and creativity-enhancing practices. Pilot results showed encouraging usability, but validation and long-term effectiveness need more research. (Gülsün et al., 2026) found that teachers' affective attitudes, subjective norms, and self-efficacy were significantly linked to inclusive classroom intentions, which were linked to personalised instruction, collaboration, and assessment. In 2026, inclusive competence was seen as a product of attitudes, efficacy, and intention structures that mediate practice. A broader and more particular

field emerged during the Rapid Growth and Intensification Stage (2024–2026). Digital transformation, competence mapping, STEM integration, and instructional motivation and atmosphere were highlighted in 2024 research. The dense 2025 literature covered collaborative professional development, inclusive education, differentiated instruction, immersive technologies, reflective identity, critical thinking, creativity, and complex reasoning, emphasizing institutional support, sustained training, and contextual adaptation. Though rare, the 2026 research imply a shift toward more refined reflective assessment and intention-based inclusive practice paradigms. Innovation uptake gave way to competence architecture, which defined teacher competence as a dynamic combination of knowledge, self-efficacy, reflection, collaboration, digital mediation, inclusion, and context-responsive pedagogical action.

Conclusion

This chronological review aimed to examine the evolution of research on teaching strategies and practices for enhancing teacher competence from 2000 to 2026, using systematically selected journal articles from the Scopus database, with the objective of identifying long-term research trends and developmental patterns. The findings indicate a progressive shift from low, exploratory outputs toward rapid and intensified scholarly engagement, structured across four phases reflecting increasing publication volume, methodological refinement, and technological integration. Early research emphasized contextual pedagogy and foundational competence, while later phases demonstrated expansion into digital learning, inclusive practices, reflective teaching, and system-level professional development. Dominant patterns reveal a transition from static skill-based views to dynamic, multidimensional competence supported by data-driven methods and emerging AI-related innovations. Chronological structuring enhances understanding by revealing hidden growth trajectories and providing a clearer temporal perspective compared to thematic reviews. Practically, the findings highlight the importance of sustained professional development, adaptive pedagogy, and technology integration, while future research should adopt interdisciplinary and real-world approaches. Limitations include reliance on a single database, keyword restrictions, and timeframe constraints. Overall, chronological reviews provide a valuable framework for understanding research evolution and guiding future evidence-based advancements in teacher competence.

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