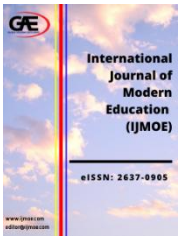
International Journal of Modern Education
EISSN: 2637-0905
IJMOE
Volume: 8 Issue: 32 (December 2026) PP. 66-85



INTERNATIONAL JOURNAL OF MODERN EDUCATION (IJMOE)
www.gaexcellence.com/ijmoe

TEACHER COMPETENCY DEVELOPMENT THROUGH PROFESSIONAL LEARNING COMMUNITIES: A CHRONOLOGICAL REVIEW

Nursyahida Sikri[1]*, Nor Hasimah Ismail[2], Siti Noor Ismail[3]

[1]School of Education, Universiti Utara Malaysia, Kedah, Malaysia
nuryahida_sikri@ahsgs.uum.edu.my https://orcid.org/0009-0009-6330-4072
[2]School of Education, Universiti Utara Malaysia, Kedah, Malaysia
nhsimah@uum.edu.my https://orcid.org/0000-0002-2311-580X
[3]School of Education, Universiti Utara Malaysia, Kedah, Malaysia
siti.noor@uum.edu.my https://orcid.org/0000-0002-0156-5893
*Corresponding Author

Article Info:

Article history:
Received date: 28.09.2026
Revised date: 13.10.2026
Accepted date: 02.11.2026
Published date: 01.12.2026

To cite this document:

Sikri, N., Ismail, N. H., & Ismail, S. N. (2026). Teacher Competency Development Through Professional Learning Communities: A Chronological Review. *International Journal of Modern Education, 8*(32), 66-85.

Abstract:

Professional Learning Communities (PLCs) have increasingly been recognised as an important mechanism for strengthening teacher competency through collaborative learning, reflective practice, knowledge sharing, and continuous professional development. Despite growing scholarly attention to PLCs, the development of research linking PLC practices with teacher competency remains fragmented, and limited evidence has systematically traced how this field has evolved over time. Therefore, this chronological literature review examines the evolution, growth, and changing research emphasis of teacher competency development through PLCs between 2007 and 2026. A systematic advanced search was conducted using the Scopus database, employing combinations of the key terms "Teacher Competency," "Professional Learning Communities," "Teacher Professional Development," "Teacher Collaboration," and "Teacher Learning." Following systematic screening and eligibility assessment, 91 primary research articles (n = 91) were retained for chronological analysis. The publication trajectory was classified into three distinctive phases based on temporal patterns and research intensity: (1) Emergence and Conceptual Formation (2007–2014), characterised by the establishment of foundational concepts connecting collaborative professional learning with teacher development; (2) Consolidation and Gradual Expansion (2015–2021), reflecting broader empirical investigation and increasing recognition of PLCs as a mechanism for professional growth; and (3) Acceleration and Research Intensification

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume: 8 Issue: 32 (December 2026) PP. 66-85

(2022–2026), marked by a substantial increase in scholarly attention and diversified research perspectives. Overall, the findings demonstrate a clear progression from conceptual exploration towards increasingly intensive and empirically oriented investigations. This review provides a structured understanding of the intellectual development of the field and highlights PLCs as an increasingly significant platform for advancing teacher competency and sustained professional learning.

DOI: 10.35631/IJMOE.832004

Keyword:

Chronological Review, Professional Learning Communities, Teacher Collaboration, Teacher Competency, Teacher Professional Development.

© The authors (2026). This is an Open Access article distributed under the terms of the Creative Commons Attribution (CC BY NC) (http://creativecommons.org/licenses/by-nc/4.0/), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact ijmoe@gaexcllence.com.

Introduction

Teacher competency development through Professional Learning Communities (PLCs) is widely described as a collaborative, school-embedded, and increasingly cross-institutional approach to strengthening the knowledge, skills, dispositions, and reflective capacities that teachers need for effective instruction. Across the literature, teacher competence is not treated as a static individual attribute but as something that grows through sustained interaction with colleagues, shared inquiry into practice, and collective responsibility for student learning (Lay, 2024; Prenger et al., 2019, 2020; Rizqi & Syafika, 2024). This framing matters because conventional professional development is often criticized for being episodic and detached from classroom realities, whereas PLCs embed learning in teachers' daily work and position collaboration as the central mechanism of professional growth (Arifin et al., 2025; Kariuki et al., 2024; Moet & Kálmán, 2024; Nurhadi & Purnama, 2025). Recent studies from schools and universities in Indonesia, China, Myanmar, Malaysia, Kenya, Vietnam, and Europe converge on the view that PLCs help teachers deepen subject knowledge, refine pedagogy, strengthen assessment practices, and build professional identity by creating structured spaces for dialogue, reflection, and experimentation). In this sense, PLCs function not only as a method of training but also as an organizational culture that supports continuous learning, mutual accountability, and the translation of new knowledge into classroom practice(Admiraal et al., 2019; Nurhadi & Purnama, 2025; Timur et al., 2025). The significance of this model has grown as education systems face demands for curriculum reform, data-informed teaching, inclusive pedagogy, and lifelong professional adaptation, all of which require teachers to learn continuously rather than intermittently (Kariuki et al., 2024; Rizqi & Syafika, 2024; Xia, 2025).

The literature also clarifies the processes through which PLCs contribute to competency development. Shared and supportive leadership, collective learning, collaborative lesson planning, classroom observation, reflective dialogue, and the analysis of student learning evidence repeatedly appear as core features of effective PLCs (Admiraal et al., 2019; Mydin et

al., 2024; Rizqi & Syafika, 2024; N. Wang & An, 2023) . These practices reduce teacher isolation and make teaching more public, enabling educators to compare approaches, receive peer feedback, and revise instruction in ways that improve both confidence and competence (Moet & Kálmán, 2024; Ni et al., 2021; Theurl et al., 2024). Several studies report that participation in PLCs is associated with gains in reflective teaching, adaptive and student-centered pedagogy, creativity, self-efficacy, and openness to innovation, suggesting that competence development extends beyond technical skill to include mindset and professional agency. Quantitative evidence supports this pattern: networked PLCs produced moderately positive effects on teachers' satisfaction, knowledge, skills, attitudes, and application to practice, while a correlational study found a significant positive relationship between PLC engagement and instructional competence, and a larger study in Chinese primary schools found that all five PLC dimensions were positively related to teacher performance (Dumandan & Paglinawan, 2025; Mydin et al., 2024; Prenger et al., 2019). Similar patterns appear across career stages and settings, including student-teacher internships and higher education, where PLCs have been shown to stimulate reflection, collaborative learning, distributed leadership, and stronger collegial ties (Theurl et al., 2024; Xia, 2025). In subject-specific contexts such as computer science and inquiry-based learning, the evidence further suggests that PLCs are especially valuable when teachers jointly examine practice, co-develop assessments, and sustain support beyond one-off workshops (Ni et al., 2021; Risnanosanti et al., 2023).

At the same time, the literature does not present PLCs as automatically effective; their contribution to teacher competency development depends heavily on design, leadership, institutional support, and sustainability. Studies consistently emphasize that PLCs work best when they are embedded in school culture, aligned with a shared vision, supported by learning leadership, and connected to routine organizational structures rather than treated as add-on activities (Admiraal et al., 2019; Nurhadi & Purnama, 2025; Rizqi & Syafika, 2024). Supportive conditions such as time, resources, policy alignment, and principal backing are repeatedly identified as enabling factors, while limited time, inconsistent motivation, lack of facilities, weak evaluation systems, insufficient training, and uneven school support are recurring barriers across contexts (Agustin & Zumrotun, 2024; Moet & Kálmán, 2024; Rizqi & Syafika, 2024; Xia, 2025). Evidence is also more mixed when PLCs extend beyond single schools into professional learning networks: cross-school collaboration appears promising, but effectiveness has been inconsistent, and additional challenges arise in transferring knowledge back to teachers' own schools and sustaining engagement over time (Prenger et al., 2019, 2020). Digital and online PLCs expand access, as seen in national online communities in Kenya and technology-supported collaboration in Indonesian schools, but studies stress that virtual interaction must be sustained, contextualized, and linked to school-level practice to produce meaningful impact (Agustin & Zumrotun, 2024; Kariuki et al., 2024; Rizqi & Syafika, 2024). Overall, the research supports the view that teacher competency development through Professional Learning Communities is most powerful when collaboration is continuous, reflective, data-informed, and institutionally supported, making PLCs a strategic pathway for strengthening pedagogical, professional, social, and personal competence in changing educational environments (F et al., 2025; Mydin et al., 2024; Rizqi & Syafika, 2024; Timur et al., 2025).

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume: 8 Issue: 32 (December 2026) PP. 66-85

Materials and Methods

Data Collection

Teacher competency development has become a central concern in contemporary educational research as teachers are increasingly expected to demonstrate pedagogical expertise, technological adaptability, reflective capacity, collaborative competence, and responsiveness to rapidly changing educational demands. Within this context, Professional Learning Communities (PLCs) have gained substantial scholarly attention as an organizational and professional learning mechanism that enables teachers to construct knowledge collectively, engage in reflective dialogue, share instructional practices, and continuously refine their professional capabilities. Despite the expanding literature on PLCs and teacher development, existing studies remain dispersed across different educational contexts, conceptual perspectives, and periods of scholarly development, making it difficult to determine how knowledge concerning PLC-driven teacher competency has evolved over time. Accordingly, this chronological review examines the intellectual and thematic progression of research on Teacher Competency Development through Professional Learning Communities, with particular attention to shifts in research priorities, conceptual emphases, and emerging directions across successive periods. Data were collected through a single-step retrieval process using the Scopus database, employing systematically constructed keywords and Boolean operators to identify relevant, high-quality peer-reviewed publications, followed by predefined eligibility criteria to ensure consistency between the retrieved literature and the review objectives. Establishing a rigorous and transparent data collection protocol is particularly important in chronological reviews because inconsistencies in database selection, search terminology, or inclusion procedures may produce temporal distortions and misleading interpretations of research development. A systematic approach therefore strengthens the reliability, validity, reproducibility, and interpretability of the evidence base, enabling meaningful identification of historical transitions, thematic continuities, knowledge gaps, and emerging trajectories in the relationship between PLCs and teacher competency development.

Table 1: The Specification For Primary Data Searching.

Keyword	**Collaborative Learning, Professional Learning Community, Teacher Competence**
Inclusion	Article, Journal, English, Final Stage, Social Science,
Exclusion	Besides social science, review article, other languages
Final Search String (Scopus)	TITLE-ABS-KEY (("teacher competency" OR "teacher competence" OR "teacher effectiveness" OR "teacher quality" OR "teacher skill*" OR "teacher training") AND ("professional learning community*" OR "professional learning" OR "collaborative learning" OR "teacher collaboration" OR "learning community*" OR "community of practice")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (SUBJAREA , "SOCI")) AND (LIMIT-TO (EXACTKEYWORD , "Professional Learning Community") OR LIMIT-TO (EXACTKEYWORD , "Teacher Competence") OR LIMIT-TO (EXACTKEYWORD , "Collaborative Learning")) AND (LIMIT-TO (PUBYEAR , "2007") OR LIMIT-TO (PUBYEAR , "2008") OR LIMIT-TO (PUBYEAR , "2009") OR LIMIT-TO (PUBYEAR , "2010") OR

	LIMIT-TO (PUBYEAR , "2011") OR LIMIT-TO (PUBYEAR , "2012") OR LIMIT-TO (PUBYEAR , "2013") OR LIMIT-TO (PUBYEAR , "2014") OR LIMIT-TO (PUBYEAR , "2015") OR LIMIT-TO (PUBYEAR , "2016") OR LIMIT-TO (PUBYEAR , "2017") OR LIMIT-TO (PUBYEAR , "2018") OR LIMIT-TO (PUBYEAR , "2019") OR LIMIT-TO (PUBYEAR , "2020") OR LIMIT-TO (PUBYEAR , "2021") OR LIMIT-TO (PUBYEAR , "2022") OR LIMIT-TO (PUBYEAR , "2023") OR LIMIT-TO (PUBYEAR , "2024") OR LIMIT-TO (PUBYEAR , "2025") OR LIMIT-TO (PUBYEAR , "2026"))
Number of Primary Article	91

The data collection strategy was designed to construct a focused and methodologically consistent corpus of studies examining teacher competency development in relation to Professional Learning Communities (PLCs) and collaborative professional learning. Scopus was employed as the sole bibliographic database, and the search was conducted using a structured TITLE-ABS-KEY query that combined competency-related terms, including “teacher competency,” “teacher competence,” “teacher effectiveness,” “teacher quality,” “teacher skill*,” and “teacher training,” with PLC-related concepts such as “professional learning community*,” “professional learning,” “collaborative learning,” “teacher collaboration,” “learning community*,” and “community of practice.” To improve the relevance and comparability of the retrieved literature, the search was restricted to journal articles published in English, indexed within the Social Sciences subject area, and classified as final-stage publications. Additional refinement through the exact keywords “Professional Learning Community,” “Teacher Competence,” and “Collaborative Learning” further narrowed the dataset to studies closely aligned with the conceptual focus of the review. Review articles, publications outside the Social Sciences domain, non-English publications, and other document types were excluded to ensure that the analysis was based primarily on original empirical contributions. The temporal coverage from 2007 to 2026 was retained to facilitate a longitudinal examination of how research on PLCs and teacher competency has developed, expanded, and shifted in emphasis over nearly two decades.

Following the application of these inclusion and exclusion criteria, the final dataset consisted of 91 primary research articles. This relatively selective corpus reflects the deliberate prioritization of conceptual relevance and methodological consistency rather than the maximization of publication volume. Such filtering is particularly important in a chronological review because overly broad retrieval strategies may introduce conceptually peripheral studies that obscure genuine patterns of intellectual development, whereas excessively narrow criteria may underrepresent related streams of scholarship. The resulting 91 articles therefore provide a sufficiently coherent evidence base for tracing changes in research intensity, conceptual orientation, methodological tendencies, and thematic priorities across different periods. Restricting the dataset to peer-reviewed journal articles in the Social Sciences also strengthens the interpretability of temporal trends by reducing heterogeneity arising from conference papers, book chapters, incomplete publications, and disciplinary contexts with substantially different research traditions. Nevertheless, the use of a single database and English-language publications may limit the representation of regionally published or non-English scholarship. Despite this limitation, the systematic search protocol enhances the reliability, transparency, and reproducibility of the review and provides a defensible foundation for identifying the

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume: 8 Issue: 32 (December 2026) PP. 66-85

evolutionary trajectory of teacher competency development through Professional Learning Communities.

Data Clustering

In a chronological review, the systematic clustering of publication data into distinct temporal phases provides an important analytical framework for tracing the development, maturation, and changing scholarly emphasis of a research field over time. For the study of Teacher Competency Development through Professional Learning Communities, grouping publications according to year and publication volume enables the longitudinal pattern of research productivity to be interpreted more meaningfully than through annual counts alone. The dataset, retrieved from the Scopus database using predefined keywords and advanced search strategies, provides a comprehensive and structured representation of the relevant literature within the specified scope. By examining variations in publication frequency across successive years, temporal clustering can identify periods of initial emergence, gradual consolidation, rapid expansion, or intensified scholarly attention, thereby revealing important turning points in the evolution of the field. Such grouping also reduces the fragmentation associated with year-by-year interpretation and allows broader trajectories in research activity to become more visible and analytically coherent. Consequently, clustering based on publication year and volume enhances the interpretability of chronological publication patterns by demonstrating how scholarly interest in Professional Learning Communities as a mechanism for teacher competency development has evolved across different stages of research development.

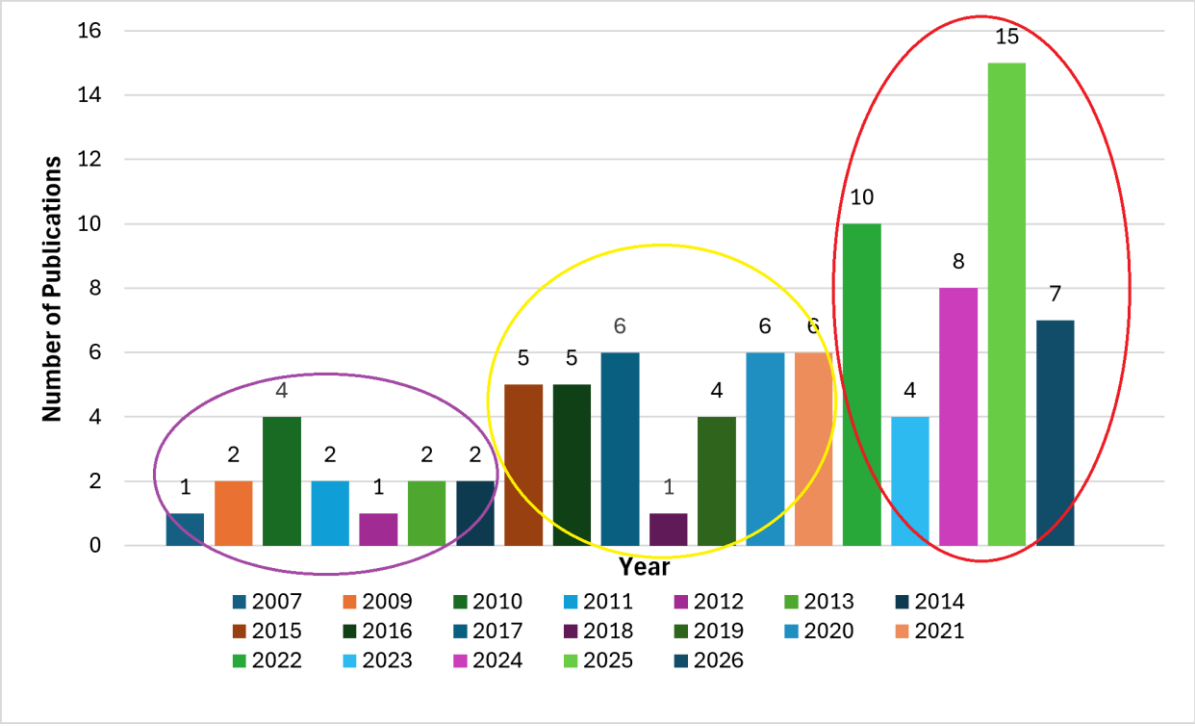


Figure 1: Chronological Distribution of Publications from 2007 to 2026

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume: 8 Issue: 32 (December 2026) PP. 66-85

Phase I: Emergence and Conceptual Formation (2007–2014)

The first phase, spanning 2007 to 2014, can be characterised as the period of emergence and conceptual formation. Research productivity remained relatively low throughout this period, with annual publication output generally ranging between one and four documents. The earliest recorded publication appeared in 2007, followed by only modest and irregular publication activity in subsequent years. A temporary increase to four publications in 2010 did not develop into sustained growth, as publication output subsequently declined and remained limited between 2011 and 2014. Overall, only 14 publications, representing approximately 15.4% of the total dataset, were produced during this period.

This pattern suggests that the relationship between PLCs and teacher competency development was still an emerging area of scholarly inquiry. Research during this formative phase was likely concerned with establishing the conceptual foundations of professional collaboration, professional learning, and teacher development. The relatively limited publication volume indicates that PLCs had not yet become a prominent research lens through which teacher competency was systematically examined. Nevertheless, this phase provided the intellectual foundation for subsequent research by positioning collaborative professional learning as a potentially important mechanism for strengthening teachers' knowledge, skills, instructional practices, and professional capacity.

Phase II: Consolidation and Gradual Expansion (2015–2021)

The second phase, covering 2015 to 2021, represents a period of consolidation and gradual expansion. Compared with the preceding phase, research productivity became noticeably higher, beginning with five publications in both 2015 and 2016 and increasing to six publications in 2017. Although publication output temporarily declined to one publication in 2018, the field subsequently recovered, with four publications in 2019 and six publications annually in both 2020 and 2021. A total of 33 publications were produced during this seven-year period, accounting for approximately 36.3% of all publications in the dataset.

The higher and relatively more sustained level of publication activity indicates that research on PLCs and teacher competency was becoming more firmly established within the broader discourse on teacher professional development. During this period, scholarly attention appears to have shifted from predominantly conceptual discussions towards greater empirical examination of how professional collaboration, shared learning, reflective practice, and collective knowledge development contribute to teachers' competencies. The fluctuations observed within the period, particularly the reduction in 2018, suggest that growth was not entirely linear. Nevertheless, the subsequent recovery and consistent publication levels between 2019 and 2021 demonstrate increasing scholarly recognition of PLCs as an important organisational and professional mechanism for continuous teacher development.

Phase III: Acceleration and Research Intensification (2022–2026)

The third phase, spanning 2022 to 2026, represents the most dynamic stage of development and can be described as a period of acceleration and research intensification. Publication output increased sharply to 10 documents in 2022, marking a substantial rise compared with previous years. Although the number declined temporarily to four publications in 2023, research activity quickly rebounded to eight publications in 2024 and reached its highest level of 15 publications

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume: 8 Issue: 32 (December 2026) PP. 66-85

in 2025. Seven publications were recorded for 2026. Collectively, this phase generated 44 publications, representing approximately 48.4% of the entire publication corpus, despite covering only the most recent five-year period.

The concentration of almost half of the total publications within this recent phase demonstrates a clear intensification of scholarly interest in teacher competency development through PLCs. This trend suggests that PLCs are increasingly being recognised not merely as professional development activities but as strategic environments for continuous learning, collaborative problem-solving, knowledge sharing, instructional improvement, and competency enhancement. The rapid expansion of research may also reflect growing educational emphasis on continuous professional development, collaborative school cultures, teacher adaptability, and the need for educators to respond to increasingly complex instructional and technological demands. Importantly, the lower publication count recorded for 2026 should not necessarily be interpreted as a decline in scholarly interest, particularly if the data were retrieved before the completion of the publication year. Instead, the substantial increase from 2022 onwards indicates that the research domain has entered a stage of heightened scholarly engagement and may continue to expand.

Results and Discussion

Phase I: Emergence and Conceptual Formation (2007–2014)

The early stage between 2007 and 2010 reflects an initial emphasis on technology supported collaboration, reflective learning, and professional preparation as mechanisms for strengthening teacher competency. Dooly (2007) reported that international online collaboration increased language awareness, confidence, motivation, and readiness to integrate online interaction into future teaching. Similarly, Todorova and Osburg (2009) found that technology oriented professional development strengthened technology integration, collaboration, teaching practice, and perceived teaching quality. Lee (2009) further demonstrated that asynchronous discussions supported reflective thinking, autonomy, accountability, and collaborative learning. By 2010, research became more explicit about competency formation. Wang et al. (2010) highlighted practice, reflection, and collaboration as interconnected elements supporting competent and confident e-teachers. Paraskevas et al. (2010) found improvements in disciplinary knowledge and sustainable professional interaction, while Lockhorst et al. (2010) showed that structured reflective tasks encouraged deeper professional communication. Marsh et al. (2010) similarly identified reflective practice and collaborative learning as contributors to accelerated professional knowledge development.

During 2011–2012, attention shifted towards the quality and conditions of collaborative competency development. Naismith et al. (2011) found positive learning outcomes from wiki-supported collaboration, although genuine co-construction was constrained by assessment practices, technological familiarity, and contextual differences Ruys et al. (2012)observed improvement in collaborative learning implementation skills over time, with teaching efficacy showing a stronger association with competency growth than training or pedagogical knowledge. Ruys et al. (2012)further identified strengths in task and material design but weaknesses in social objectives and collaborative rules, indicating that competency development required attention to both instructional and social dimensions.

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume: 8 Issue: 32 (December 2026) PP. 66-85

The 2013–2014 period shows broader diversification in approaches to professional learning. Golightly and Muniz (2013) reported positive perceptions of problem-based learning, particularly among higher-performing participants, while Jia (2013) demonstrated improved training effectiveness through reinforcement-based cooperative learning. García-Valcárcel et al. (2014)highlighted the perceived value of ICT supported collaboration alongside practical implementation difficulties. Banegas a Manzur Busleimán (2014), however, showed that autonomy and individual activities could outweigh collaborative learning in online teacher education. Collectively, Phase I developed from technology-enabled interaction towards a more nuanced understanding of reflection, collaboration, efficacy, context, and instructional design as foundations of teacher competency development.

Phase II: Consolidation and Gradual Expansion (2015–2021)

During 2015–2016, research increasingly connected collaborative learning with specific dimensions of teacher competency.Peltonen (2015) showed that collegial interaction and peer support strengthened entrepreneurial teaching competence and professional confidence, while Prieß-Buchheit (2015) associated collaborative activities with stronger critical judgement concerning assessment practices. Zhou et al. (2015) further positioned MOOC supported collaboration as an alternative model for sustained teacher training. In 2016, Pombo et al. (2016) connected blended professional learning with digital literacy development, whereas Kaendler et al. (2016) demonstrated measurable gains in teachers' monitoring competence through video-based training. Gartmeier et al. (2016) associated stronger communication competence with greater professional exchange among colleagues. Netolicky, (2016) broadened the interpretation of professional learning by emphasizing individualized transformational experiences, while Borba et al. (2016) identified blended learning, digital technologies, and collaboration as growing directions in teacher development.

Between 2017 and 2019, the literature became more diversified and competency oriented. Sobocinski et al. (2017) highlighted regulation processes required for successful collaboration, while Álvarez-Arregui et al., (2017), Colon et al., (2017) and Sánchez-Valero et al., (2017) reported gains in digital, collaborative, and media-related competencies. Wilson et al. (2017) identified communication, shared decision-making, interdependence, and instructional flexibility as collaborative competencies. Gaikhorst et al. (2017) further linked sustained competency development with an open school culture. Sailin and Mahmor (2018) showed that meaningful learning strengthened digital pedagogical knowledge and confidence. By 2019, Wiedmann et al., (2019) demonstrated the feasibility of assessing professional vision, Kurek and Müller-Hartmann (2019) linked instructional presence with professional competence, Tejada and Morel, (2019) reported stronger ICT confidence, andAslamiah et al. (2019) emphasized PLC based collaboration for school quality improvement.

The 2020–2021 period marked stronger integration of PLCs, digital environments, and continuous professional development. Eklund et al. (2020), Shonfeld and Magen-Nagar (2020), Sime and Themelis (2020) and Tas et al. (2020) showed that collegial support, technology confidence, online professional identity, and PLC-based mentoring contributed to competency development. Gillanders & Franco Vázquez (2020); Köpeczi-Bócz (2020) further demonstrated the value of project-based and portfolio-oriented learning. In 2021, Aurava et al. (2021), Murad et al. 2021 and Zahedi et al. (2021) collectively indicated a shift towards mobile collaboration, peer feedback, PLC participation, flipped learning, digital competence, critical thinking, and sustained professional learning. Overall, Phase II reflects movement from

isolated collaborative strategies towards more structured, technology-supported, and school-embedded competency development.

Phase III: Acceleration and Research Intensification (2022–2026)

The 2022 early acceleration period shows a clear movement from general collaborative learning towards competency development through structured Professional Learning Communities and technology-supported professional learning. Vehachart et al. (2022)high teacher competency in science and mathematics following PLC supported development, while Jafar et al. (2022) identified professional values, shared planning, and transformational leadership as significant cultural conditions supporting PLC implementation. Collaborative learning also strengthened conceptual understanding, professional reflection, teaching design, and technology-related beliefs across studies by Calavia et al., 2022; Fauziah & Putri, 2022; García-Valcárcel et al., 2014; Kjerland & Annerstedt, 2022; Nikimaleki & Rahimi, 2022; Wu et al., 2022). Collectively, these findings indicate that competency development had become increasingly connected with collaboration, digital environments, lesson study, and context-responsive professional learning.

During 2023–2024, research expanded towards contextualized PLC implementation, inclusive competence, blended teaching, digital literacy, and collaborative professional practice. Al Mahdi et al. (2023) highlighted leadership, resources, and collaborative school culture as essential conditions for effective PLCs. Latorre-Cosculluela et al. (2023) linked teacher efficacy and sustained inclusive practices with stronger educational inclusion, while Chiu & Hsiao, (2023) demonstrated the importance of interaction in collaborative knowledge construction. In 2024, Linh et al., (2024)found a statistically significant, although weak, association between PLC participation and blended teaching competence. Other studies extended competency development towards digital literacy, collaboration, evidence-based teaching, creativity, and technology adaptation (Alzubi et al., 2024; Asad & Hussain, 2024; Molina-Torres, (2024); Pavlou, (2024); Stošić & Guillén-Gámez, 2024; Swallow & Tomalin, (2024).

Research during 2025–2026 increasingly adopted a multidimensional perspective on teacher competence, incorporating artificial intelligence, emotional regulation, professional leadership, hybrid learning, reflective practice, and contextual adaptability. Artificial intelligence and digital tools emerged as new supports for collaborative learning and teacher competency development. Kılıçkaya & Kic-Drgas, 2025; Lee and Bryan 2025; and Xu et al., 2025), while Li et al. (2025)l conceptualized professional competence within project-based learning contexts. Other studies highlighted leadership, emotional support, technology integration, differentiated collaborative roles, and evolving PLC processes (González-Weil et al., 2025; Haruna et al., 2025; Hu & Wang, 2025; M. Wang & Zhang, 2025; Y. Wang et al., 2025). By 2026, the literature had diversified further into context-based professional development, learning-community platforms, discipline-specific competence, leadership and school climate, outdoor education competence, and technology-mediated collaboration Birgün & Kırkgöz, (2026). Overall, Phase III represents a transition from PLC participation itself towards understanding how collaborative structures, technologies, leadership, and professional relationships jointly shape sustainable teacher competency development.

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume: 8 Issue: 32 (December 2026) PP. 66-85

Conclusion

This chronological review examined the evolution of research on teacher competency development through Professional Learning Communities (PLCs) from 2007 to 2026, drawing on 91 primary research articles retrieved from the Scopus database. The findings show a clear progression in the field, from an initially limited and conceptually oriented body of work towards a more established, empirically diverse, and technologically responsive area of educational research. Across the reviewed period, PLCs increasingly emerged as an important mechanism for supporting continuous teacher learning, professional collaboration, reflective practice, and competency development.

The chronological analysis identified three distinct phases. The first phase, Emergence and Conceptual Formation (2007–2014), represented the early development of the field, during which research mainly focused on collaborative learning, reflective practice, professional interaction, and technology-supported teacher learning. The second phase, Consolidation and Gradual Expansion (2015–2021), reflected a broader and more sustained research interest, with increasing attention to specific dimensions of teacher competency, including digital competence, communication, instructional decision-making, professional reflection, and collaborative practice. The third phase, Acceleration and Research Intensification (2022–2026), accounted for almost half of the reviewed publications and demonstrated a marked expansion in research on PLC structures, leadership, digital environments, inclusive practice, contextual adaptability, and technology-supported professional learning. This progression indicates that the field has moved beyond viewing teacher competency primarily as an individual attribute towards understanding it as a capacity that can be developed through sustained social interaction, shared inquiry, collective learning, and professional engagement.
Conceptually, the review contributes to the literature by showing how the meaning of teacher competency development has expanded over time. Earlier studies tended to focus on discrete collaborative activities and technology-mediated interaction, whereas more recent research increasingly situates competency development within broader professional ecosystems involving PLC structures, leadership, institutional support, digital technologies, and collaborative relationships. The chronological perspective therefore provides a useful lens for understanding how contemporary emphases on digital competence, AI-supported learning, collaborative professional development, and teacher adaptability have evolved from earlier work on reflection, peer interaction, professional dialogue, and technology-enabled collaboration. Rather than emerging as separate research trends, these developments appear to form part of a longer trajectory in which teacher learning has progressively become more collective, context-sensitive, and multidimensional.

From a practical perspective, the findings reinforce the importance of designing PLCs as sustained professional learning environments rather than as isolated or short-term development activities. School leaders and educational institutions may strengthen teacher competency by providing structured opportunities for collaborative lesson planning, reflective dialogue, peer feedback, shared problem-solving, professional knowledge exchange, and the meaningful use of digital technologies. The findings also suggest that effective PLC implementation requires supportive organisational conditions, including leadership commitment, adequate time, access to resources, and a school culture that values trust, collaboration, and continuous learning. As digital and AI-supported tools become more prominent, their use should complement rather than replace professional interaction, pedagogical judgement, and context-sensitive decision-making.

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume: 8 Issue: 32 (December 2026) PP. 66-85

Several limitations should be acknowledged. The review relied exclusively on the Scopus database and was restricted to English-language journal articles within the Social Sciences subject area and predefined search terms. Consequently, relevant studies indexed in other databases, published in other languages, or classified under other disciplinary categories may not have been represented. In addition, the inclusion of publications up to 2026 requires cautious interpretation because the publication output for the most recent year may be incomplete. These limitations may affect the comprehensiveness of the corpus and the interpretation of temporal publication patterns.

Future research should therefore consider integrating multiple databases, broader search terminology, multilingual sources, and interdisciplinary perspectives to provide a more comprehensive account of PLC-related teacher competency development. Further studies are also needed to examine how different PLC structures influence specific dimensions of teacher competency across educational levels, geographical contexts, career stages, and technological environments. Longitudinal, mixed-method, comparative, and intervention-based research may be particularly valuable for explaining how competency develops over time, how professional learning is sustained, and how improvements are transferred into authentic classroom practice and educational outcomes. Emerging areas such as AI-assisted professional learning, digital collaboration, teacher agency, leadership, inclusion, sustainability, and the ethical use of intelligent technologies also warrant closer investigation.

Overall, the chronological evidence demonstrates that research on teacher competency development through PLCs has evolved from an emerging conceptual area into a more established and multidimensional field of educational inquiry. The review highlights the value of chronological analysis not merely for describing publication growth, but for revealing shifts in research priorities, conceptual development, professional practices, and technological change over time. By tracing these developments across successive phases, this review provides a structured foundation for future research and supports the continued development of PLCs as strategic environments for strengthening teacher competency in increasingly complex educational contexts.

Acknowledgements: The author gratefully acknowledges Associate Professor Dr. Nor Hasimah Ismail and Professor Dr. Siti Noor Ismail, School of Education, Universiti Utara Malaysia, for their invaluable guidance, insightful comments, and continuous support throughout the completion of this study. The author also extends sincere appreciation to the School of Education, Universiti Utara Malaysia, for providing academic support and facilities that contributed to the successful completion of this research.

Funding Statement: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest Statement: The authors declare that they have no conflicts of interest regarding the publication of this paper.

Ethics Statement: This study did not involve any human participants, animals, or sensitive data requiring ethical approval. As a systematic literature review based exclusively on published studies, ethical approval and informed consent were not required. The authors confirm that the research was conducted in accordance with accepted academic integrity and ethical publishing standards.

Author Contribution Statement: All authors contributed significantly to the development of this manuscript. All authors were responsible for the conceptualization, methodology, and overall supervision of the study, analysis, and interpretation of results. All authors read and approved the final version of the manuscript prior to submission.

References

Admiraal, W., Schenke, W., De Jong, L., Emmelot, Y., & Sligte, H. (2019). Schools as professional learning communities: what can schools do to support professional development of their teachers? *Professional Development in Education*, *47*, 684–698. https://doi.org/10.1080/19415257.2019.1665573

Agustin, I. S., & Zumrotun, E. (2024). The role of the learning community as a means of developing teacher professionalism in elementary schools. *Jurnal Ilmiah Pendidikan Dasar, 11*(2), 166–186. https://doi.org/10.30659/pendas.11.2.166-186

Al Mahdi, O., de Munnik, M., Meinen, L., & Green, M. (2023). Professional Learning Communities in Private Schools in Bahrain and Oman: Reflection on Two Cases. *ECNU Review of Education*, *6*(3), 469–484. https://doi.org/10.1177/20965311221131583

Álvarez-Arregui, E., Rodríguez-Martín, A., Madrigal-Maldonado, R., Grossi-Sampedro, B.-Á., & Arreguit, X. (2017). Ecosystems of media training and competence: International assessment of its implementation in higher education. *Comunicar*, *25*(51), 105–114. https://doi.org/10.3916/C51-2017-10

Alzubi, A. A. F., Nazim, M., & Ahmad, J. (2024). Exploring teachers' perceptions of EFL students' engagement in collaborative learning: Implementation issues and suggestions. *Qubahan Academic Journal, 4*(1), 250–264. https://doi.org/10.48161/qaj.v4n1a383

Arifin, Laia, B., Windayani, N. L. I., Ndraha, L. D. M., Dewi, N. W. R., Djara, J. I., & Subayil, I. (2025). Improving the professional competence of teachers through learning communities. *Jurnal Iqra': Kajian Ilmu Pendidikan, 10*(1), 95–109. https://doi.org/10.25217/ji.v10i1.4154

Asad, M. M., & Hussain, S. (2024). Effect of creative and collaborative learning communities on virtual learning environment for Education 4.0: a quantitative study of Pakistan. *Journal of Applied Research in Higher Education*, *16*(5), 1533–1547. https://doi.org/10.1108/JARHE-01-2023-0042

Aslamiah, Suriansyah, A., Amelia, R., & Ngadimun. (2019). Building professional learning communities (PLC) to increase the quality of education in elementary schools. *International Journal of Innovation, Creativity and Change, 5*(4), 583–598

Aurava, R., Meriläinen, M., Kankainen, V., & Stenros, J. (2021). Game jams in general formal education. *International Journal of Child-Computer Interaction*, *28*. https://doi.org/10.1016/j.ijcci.2021.100274

Banegas, D. L., & Manzur Busleimán, G. I. (2014). Motivating factors in online language teacher education in southern Argentina. *Computers and Education*, *76*, 131–142. https://doi.org/10.1016/j.compedu.2014.03.014

Birgün, M., & Kırkgöz, Y. (2026). A context-based English Medium Instruction professional development programme for Turkish EMI lecturers: Insights from a grounded design study. *Review of Education*, *14*(2). https://doi.org/10.1002/rev3.70157

Borba, M. C., Askar, P., Engelbrecht, J., Gadanidis, G., Llinares, S., & Aguilar, M. S. (2016). Blended learning, e-learning and mobile learning in mathematics education. *ZDM - Mathematics Education*, *48*(5), 589–610. https://doi.org/10.1007/s11858-016-0798-4

Calavia, M. B., Blanco, T., Casas, R., & Dieste, B. (2022). Improving Design Project Management in Remote Learning. *Sustainability (Switzerland)*, *14*(17). https://doi.org/10.3390/su141711025

Chiu, M.-S., & Hsiao, Y. P. A. (2023). Process Indicators for Grading Group Essays: Learning Analytics of Assessment Data and Online Behaviour. *Athens Journal of Education*, *10*(4), 575–592. https://doi.org/10.30958/aje.10-4-2

Colon, A. M. O., Galiano, I. M. M., & Colmenero-Ruiz, M. J. (2017). Impact of the flipped classroom model and collaborative learning in childhood teaching university degree. *Journal of E-Learning and Knowledge Society*, *13*(3), 131–143. https://doi.org/10.20368/1971-8829/1358

Dooly, M. (2007). Joining forces: Promoting metalinguistic awareness through computer-supported collaborative learning. *Language Awareness*, *16*(1), 57–74. https://doi.org/10.2167/la413.0

Dumandan, F., & Paglinawan, J. L. (2025). The relationship of Professional Learning Communities' (PLC) engagement towards teachers' competence. *International Journal of Research and Innovation in Applied Science, 10*(5), 499–516. https://doi.org/10.51584/IJRIAS.2025.100500046

Eklund, G., Sundqvist, C., Lindell, M., & Toppinen, H. (2021). A study of Finnish primary school teachers' experiences of their role and competences by implementing the three-tiered support. *European Journal of Special Needs Education, 36*(5), 729–742. https://doi.org/10.1080/08856257.2020.1790885

Fauziah, A., & Putri, R. I. I. (2022). COLLABORATIVE LEARNING THROUGH LESSON STUDY IN PMRI TRAINING FOR PRIMARY SCHOOL PRE-SERVICE TEACHER: THE SIMULATION OF POLYGON MATTER. *Infinity Journal*, *11*(1), 1–16. https://doi.org/10.22460/infinity.v11i1.p1-16

Gaikhorst, L., Beishuizen, J. J. J., Zijlstra, B. J. H., & Volman, M. L. L. (2017). The sustainability of a teacher professional development programme for beginning urban teachers. *Cambridge Journal of Education*, *47*(1), 135–154. https://doi.org/10.1080/0305764X.2015.1125449

García-Valcárcel, A., Basilotta, V., & López García, C. (2014). ICT in collaborative learning in the classrooms of primary and secondary education. *Comunicar*, *21*(42), 65–74. https://doi.org/10.3916/C42-2014-06

Gartmeier, M., Gebhardt, M., & Dotger, B. (2016). How do teachers evaluate their parent communication competence? Latent profiles and relationships to workplace behaviors. *Teaching and Teacher Education, 55*, 207–216. https://doi.org/10.1016/j.tate.2016.01.009

Gillanders, C., & Franco Vázquez, C. (2020). Towards the inclusion of a gender perspective in arts projects: a case study in secondary teacher training. *Gender and Education*, *32*(6), 767–783. https://doi.org/10.1080/09540253.2018.1513455

Golightly, A., & Muniz, O. A. (2013). Are South African Geography education students ready for problem-based learning? *Journal of Geography in Higher Education*, *37*(3), 432–455. https://doi.org/10.1080/03098265.2013.794332

González-Weil, C., Fernández Araneda, F., & Reyes-Espejo, M. I. (2025). "This makes me feel good": Professional learning communities as a space for interpersonal emotion regulation among science teachers. *International Journal of Educational Research*, *134*. https://doi.org/10.1016/j.ijer.2025.102829

Haruna, H. H., Iftikhar, S., Isa, S. M., & Hasan, M. M. (2025). Effect of professional development, collaborative learning, and technology integration on teachers' self-access support competence. *SiSal Journal, 16*(3), 526–565. https://doi.org/10.37237/160304

Hu, R., & Wang, C. (2025). When Teacher Training Shifts From Offline to Online: Roles, Efficacy Beliefs, and Cognitive Load of Collaboration. *SAGE Open*, *15*(3). https://doi.org/10.1177/21582440251382023

Jafar, M. F., Yaakob, M. F. M., Awang, H., Zain, F. M., & Kasim, M. (2022). Disentangling the Toing and Froing of Professional Learning Community Implementation by

Reconnecting Educational Policy with School Culture. *International Journal of Instruction*, *15*(2). https://doi.org/10.29333/iji.2022.15218a

Jia, F. (2013). A multi-agent collaborative learning scheme for young university teachers based on reinforcement learning. *World Transactions on Engineering and Technology Education*, *11*(4), 495–499. https://www.scopus.com/pages/publications/84892892848?origin=resultslist

Kaendler, C., Wiedmann, M., Leuders, T., Rummel, N., & Spada, H. (2016). Monitoring Student Interaction during Collaborative Learning: Design and Evaluation of a Training Program for Pre-Service Teachers. *Psychology Learning and Teaching*, *15*(1), 44–64. https://doi.org/10.1177/1475725716638010

Kariuki, D., Itegi, F., & Mutuma, W. (2024). Reorienting teacher professional development in Kenya: Professional Learning Communities paradigm. *Journal of the Kenya National Commission for UNESCO*. https://doi.org/10.62049/jkncu.v4i2.110

Kılıçkaya, F., & Kic-Drgas, J. (2025). Enhancing collaborative learning practices via chatbots: insights from an efl context. *SAGE Open*, *15*(3). https://doi.org/10.1177/21582440251369189

Kjerland, G. Ø., & Annerstedt, C. (2022). Applying learning theories in learning how to teach physical education: a study of teacher education students collaborative learning processes in a project. *Sport, Education and Society*, *27*(6), 689–702. https://doi.org/10.1080/13573322.2021.1902799

Köpeczi-Bócz, T. (2020). Learning portfolios and proactive learning in higher education pedagogy. *International Journal of Engineering Pedagogy*, *10*(5), 34–48. https://doi.org/10.3991/ijep.v10i5.13793

Kurek, M., & Müller-Hartmann, A. (2019). The formative role of teaching presence in blended virtual exchange. *Language Learning and Technology*, *23*(3), 52–73. https://www.scopus.com/pages/publications/85075347377?origin=resultslist

Latorre-Cosculluela, C., Rivera-Torres, P., & Liesa-Orús, M. (2023). Exploring teachers' perceptions of effective inclusive practices with students with ASD: a structural equation modelling approach. *European Journal of Special Needs Education*, *38*(4), 466–481. https://doi.org/10.1080/08856257.2022.2120330

Lay, M. M. M. (2024). Professional Learning Communities supporting professional development of teacher educators in Myanmar education colleges. *Pedagógusképzés*. https://doi.org/10.37205/tel-hun.2024.1.02

Lee, H., & Bryan, L. M. (2025). Integrating AI in teacher education: exploring the impact on preservice teacher competencies. *Professional Development in Education*, *51*(3), 478–494. https://doi.org/10.1080/19415257.2025.2490000

Lee, L. (2009). Scaffolding collaborative exchanges between expert and novice language teachers in threaded discussions. *Foreign Language Annals*, *42*(2), 212–228. https://doi.org/10.1111/j.1944-9720.2009.01018.x

Li, S., Qi, C., & Li, R. (2025). The conceptualization of mathematics teachers' professional competence in project-based learning contexts. *Eurasia Journal of Mathematics, Science and Technology Education, 21*(7), em2660. https://doi.org/10.29333/ejmste/16562

Linh, D. N., Kasule, G. W., & van Ninh, N. (2024). Perception of teachers towards blended teaching competence enhancement in Vietnam. *International Journal of Education and Practice*, *12*(2), 435–446. https://doi.org/10.18488/61.v12i2.3696

Lockhorst, D., Admiraal, W., & Pilot, A. (2010). CSCL in teacher training: What learning tasks lead to collaboration? *Technology, Pedagogy and Education*, *19*(1), 63–78. https://doi.org/10.1080/14759390903579190

Makarim F, U., Pujiningsih, A., Khanifah, S., & Nurkolis, N. (2025). Efektivitas pengembangan profesionalisme guru melalui komunitas belajar di SDN 1 Trembes Kecamatan Gunem, Kabupaten Rembang. *Cetta: Jurnal Ilmu Pendidikan, 8*(3), 98–109. https://doi.org/10.37329/cetta.v8i3.4211

Marsh, B., Mitchell, N., & Adamczyk, P. (2010). Interactive video technology: Enhancing professional learning in initial teacher education. *Computers and Education*, *54*(3), 742–748. https://doi.org/10.1016/j.compedu.2009.09.011

Moet, M. M. L., & Kálmán, A. (2024). Impact of a Professional Learning Community on the Professional Development of Teacher Educators in Myanmar. *Opus et Educatio*. https://doi.org/10.3311/ope.627

Molina-Torres, M. P. (2024). Flipped classroom to teach digital skills during covid-19. *Journal of Technology and Science Education*, *14*(1), 158–168. https://doi.org/10.3926/jotse.2256

Murad, T., Sakhnin, Y. G., & Assadi, J. (2021). The effect of teachers' attitudes towards collaborative instruction on students' writing and speaking skills. *Journal of Language Teaching and Research*, *12*(3), 343–351. https://doi.org/10.17507/jltr.1203.03

Mydin, A.-A., Xia, Y., & Long, Y. (2024). Professional learning communities and their impact on teacher performance: Empirical evidence from public primary schools in Guiyang. *Teaching and Teacher Education, 148*, 104715. https://doi.org/10.1016/j.tate.2024.104715

Naismith, L., Lee, B.-H., & Pilkington, R. M. (2011). Collaborative learning with a wiki: Differences in perceived usefulness in two contexts of use. *Journal of Computer Assisted Learning*, *27*(3), 228–242. https://doi.org/10.1111/j.1365-2729.2010.00393.x

Netolicky, D. M. (2016). Rethinking professional learning for teachers and school leaders. *Journal of Professional Capital and Community*, *1*(4), 270–285. https://doi.org/10.1108/JPCC-04-2016-0012

Ni, L., Bausch, G., & Benjamin, R. (2023). Computer science teacher professional development and professional learning communities: A review of the research literature. *Computer Science Education, 33*(1), 29–60. https://doi.org/10.1080/08993408.2021.1993666

Nikimaleki, M., & Rahimi, M. (2022). Effects of a collaborative AR-enhanced learning environment on learning gains and technology implementation beliefs: Evidence from a graduate teacher training course. *Journal of Computer Assisted Learning*, *38*(3), 758–769. https://doi.org/10.1111/jcal.12646

Nurhadi, N., & Purnama, S. (2025). Teacher Professional Transformation Through Learning Community Management: A Literature Review. *Literasi: Jurnal Ilmu Pendidikan*. https://doi.org/10.21927/literasi.2025.16(3).403-416

Paraskevas, A., Lambrinos, N., & Psillos, D. (2010). A Study Of A Blended Didactic Approach To Teacher Professional Development In geography. *European Journal of Geography*, *1*(1),46–60. https://www.scopus.com/pages/publications/85067626747?origin=resultslist

Pavlou, V. (2024). Bringing the Studio Home: Fostering Socially Engaged Arts Education and Sustainability in Online Learning. *Sustainability (Switzerland)*, *16*(23). https://doi.org/10.3390/su162310406

Peltonen, K. (2015). How can teachers' entrepreneurial competences be developed? A collaborative learning perspective. *Education and Training*, *57*(5), 492–511. https://doi.org/10.1108/ET-03-2014-0033

Pombo, L., Carlos, V., & Loureiro, M. J. (2016). Edulabs for the integration of technologies in basic education – monitoring the agire project. *International Journal of Research in Education and Science*, *2*(1), 16–29. https://doi.org/10.21890/ijres.56518

Prenger, R., Poortman, C. L., & Handelzalts, A. (2021). Professional learning networks: From teacher learning to school improvement? *Journal of Educational Change, 22*(1), 13–52. https://doi.org/10.1007/s10833-020-09383-2

Prenger, R., Poortman, C. L., & Handelzalts, A. (2019). The Effects of Networked Professional Learning Communities. *Journal of Teacher Education*, *70*(5), 441–452. https://doi.org/10.1177/0022487117753574

Prieß-Buchheit, J. (2015). Economics from a different point of view − Good practice in teacher training: How to handle, use and judge external standardized tests in schools. *Journal of Social Science Education*, *14*(4), 64–69. https://doi.org/10.2390/jsse-v14-i4-1394

Risnanosanti, R., Susyla, D., Suyuthie, H., Mursalin, M., Naziev, A., Koklu, O., & Salcedo, A. (2023). Development of teacher professionalism in inquiry learning through learning community. *Electronic Journal of Education, Social Economics and Technology*. https://doi.org/10.33122/ejeset.v4i1.80

Rizqi, P. U., & Syafika, W. (2024). Strengthening Professional Learning Communities Through Policy and Institutional Support in Diverse Educational Contexts. *Sinergi International Journal of Education*. https://doi.org/10.61194/education.v2i3.587

Ruys, I., van Keer, H., & Aelterman, A. (2012). Examining pre-service teacher competence in lesson planning pertaining to collaborative learning. *Journal of Curriculum Studies*, *44*(3), 349–379. https://doi.org/10.1080/00220272.2012.675355

Sailin, S. N., & Mahmor, N. A. (2018). Improving student teachers' digital pedagogy through meaningful learning activities. *Malaysian Journal of Learning and Instruction*, *15*(2), 143–173. https://www.scopus.com/pages/publications/85059302451?origin=resultslist

Sánchez-Valero, J.-A., Arrazola-Carballo, J., & Calderón-Garrido, D. (2017). The DIYLab project (Do It Yourself in Education: Expanding Digital Competence to Foster Student Agency and Collaborative Learning). *Cultura y Educacion*, *29*(4), 871–878. https://doi.org/10.1080/11356405.2017.1383637

Shonfeld, M., & Magen-Nagar, N. (2020). The Impact of an Online Collaborative Program on Intrinsic Motivation, Satisfaction and Attitudes Towards Technology. *Technology, Knowledge and Learning*, *25*(2), 297–313. https://doi.org/10.1007/s10758-017-9347-7

Sime, J.-A., & Themelis, C. (2020). Educators' perspectives on transmedia identity management: Redefining tele-teacher presence. *Distance Education*, *41*(1), 70–85. https://doi.org/10.1080/01587919.2020.1727292

Sobocinski, M., Malmberg, J., & Järvelä, S. (2017). Exploring temporal sequences of regulatory phases and associated interactions in low- and high-challenge collaborative learning sessions. *Metacognition and Learning*, *12*(2), 275–294. https://doi.org/10.1007/s11409-016-9167-5

Stošić, L., & Guillén-Gámez, F. D. (2024). The potential of IT tools in foreign language acquisition: A comparative assessment. *Training, Language and Culture*, *8*(4), 95–108. https://doi.org/10.22363/2521-442X-2024-8-4-95-108

Swallow, D., & Tomalin, B. (2024). Design thinking in education: A paradigm shift in language learning. *Training, Language and Culture*, *8*(4), 86–94. https://doi.org/10.22363/2521-442X-2024-8-4-86-94

Tas, T., Houtveen, T., & Van de Grift, W. (2020). Effects of data feedback in the teacher training community. *Journal of Professional Capital and Community*, *5*(1), 27–50. https://doi.org/10.1108/JPCC-09-2019-0023

Theurl, P., Frick, E., & Barrios, E. (2024). Professional Learning Communities of Student Teachers in Internship. *Education Sciences*, *14*(7). https://doi.org/10.3390/educsci14070706

Timur, C. N., Suyatno, S., & Santosa, A. (2025). The Role of Learning Communities in Developing Teacher Competence. *Edusoshum : Journal of Islamic Education and Social Humanities*. https://doi.org/10.52366/edusoshum.v5i1.192

Todorova, A., & Osburg, T. H. (2009). Teacher professional development for the knowledge society: The Intel® teach advanced online program. *International Journal of Learning*, *16*(11), 73–82. https://www.scopus.com/pages/publications/77951122421?origin=resultslist

Vehachart, R., Wetviriyasakul, P., Srisakda, V., Tipdech, O., & Yangchin, S. (2022). The Development of Teacher Competencies in the 21st Century with a PLC in the Island. *Res Militaris*, *12*(2), 7175–7183. https://www.scopus.com/pages/publications/85142133509?origin=resultslist

Wang, M., & Zhang, L. (2025). Teacher leadership in professional learning communities in early childhood education: A Chinese perspective. *Educational Management Administration and Leadership*, *53*(5), 1063–1082. https://doi.org/10.1177/17411432241240604

Wang, N., & An, B. (2023). Improving teachers' professional development through professional learning community: Voices from secondary school teachers at Malaysian Chinese independent schools. *Heliyon*, *9*. https://doi.org/10.1016/j.heliyon.2023.e17515

Wang, Y., Chen, N.-S., & Levy, M. (2010). The design and implementation of a holistic training model for language teacher education in a cyber face-to-face learning environment. *Computers and Education*, *55*(2), 777–788. https://doi.org/10.1016/j.compedu.2010.03.010

Wang, Y., Liu, D., & Tong, P. (2025). Teacher development in an evolving online professional learning community: an action research study. *Teachers and Teaching: Theory and Practice*, *31*(5), 707–725. https://doi.org/10.1080/13540602.2023.2282485

Wilson, L., McNeill, B., & Gillon, G. T. (2017). Inter-professional education of prospective speech–language therapists and primary school teachers through shared professional practice placements. *International Journal of Language and Communication Disorders*, *52*(4), 426–439. https://doi.org/10.1111/1460-6984.12281

Wu, X., Zhang, H., Lam, J. F. I., & Li, F. (2022). The Mechanism Research of Teacher's Quality Formation in Multicultural Education -Taking Macau's Basic Education as an Example. *ACM International Conference Proceeding Series*, 279–285. https://doi.org/10.1145/3543321.3543367

Xia, Y. (2025). Enhancing Teacher Development through Professional Learning Communities: A Mixed-Methods Study in Chinese Universities. *Studies in English Language Teaching*. https://doi.org/10.22158/selt.v13n1p63

Xu, D., Wang, X., & Zhao, L. (2025). Artificial Intelligence Empowers Excellent Primary and Secondary School Teachers with Collaborative Education in Dual Teacher Communities. *International Journal of Web-Based Learning and Teaching Technologies*, *20*(1). https://doi.org/10.4018/IJWLTT.384515

Zahedi, S., Bryant, C. L., Iyer, A., & Jaffer, R. (2021). Professional learning communities at a primary and secondary school network in India. *Asia Pacific Education Review*, *22*(2), 291–303. https://doi.org/10.1007/s12564-020-09665-7

Zhou, Q.-G., Guo, S.-C., & Zhou, R. (2015). Investigation about participatory teachers' training based on MOOC. *International Journal of Distance Education Technologies*, *13*(3), 44–52. https://doi.org/10.4018/IJDET.2015070103