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A Comprehensive Analysis of Teacher Professional Learning Communities: A Scopus-Based Review (2019–2024)

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Abstract. Professional learning communities (PLCs) play a pivotal role in fostering continuous professional development for educators. However, the broad picture of PLCs has been under investigated in recent years. We filled this research gap by conducting a mixed systematic review of PLCs. Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) model, 27 publications from Scopus between 2019 and 2024 were extracted and analyzed. Our analysis primarily focused on discerning the prominent research trends in this field, scrutinizing research article counts, and examining countries, authors citation counts, and keywords of the selected articles. The findings reveal the existence of 12 issues pertaining to recent teacher PLCs. Notably, the number of research articles addressing this topic exhibited an upward trajectory, with the journal *Teaching and Teacher Education* serving as the preferred publication outlet for authors. Among the influential contributors in this domain, the research conducted by Yin et al. (2019) from Hong Kong held the greatest sway. Commonly recurring keywords in the analyzed articles include learning, professional, community, and teacher. Consequently, this research review offers a comprehensive overview of teacher PLCs, thus providing valuable guidance for educational researchers and practitioners in shaping future research endeavors.

Keywords: leadership; network analysis; PRISMA; professional learning communities; teacher professional growth

1. Introduction

In contemporary society, teacher professional learning communities (PLCs) are increasingly acknowledged for their pivotal role and significance in fostering continuous professional development for educators (Ismail et al., 2020; Kloser et al., 2021). Although there is no consensus on the definition of *PLCs,* in the

current study, they are understood as collaborative platforms for educators to enhance student learning outcomes and teacher professional development (Stoll et al., 2006; Tuli & Bekele, 2020). These communities are recognized as one of the fundamental factors that contributes to the enhancement of educational quality within schools, exemplifying the cooperative efforts of teacher groups and their remarkable collective effectiveness (Gunning et al., 2020; Khun-Inkeeree et al., 2023). In comparison to alternative forms of learning and training, teacher learning communities provide a conducive and positive learning space that facilitates teacher professional development, upholds teacher quality, and fosters mutual support among educators (Stoll et al., 2006; Tuli & Bekele, 2020). Moreover, it is imperative to note that these communities play a crucial role in assisting teachers in developing their professional identity and autonomy in pedagogical practice (McPherson & Asghar, 2023).

Despite their numerous advantages, PLCs have also faced certain difficulties and barriers (Barr & Askell-Williams, 2020; Chen, 2020; Jalaludin et al., 2022). One of the major challenges is the lack of continuous PLC implementation in practice, resulting in the issue of PLC sustainability (Stoll et al., 2006). As such, several scholars have conducted literature reviews of prior studies on different perspectives on PLCs, from concept, advantages, and challenges, to themes and factors (Ishak et al., 2020; Jalaludin et al., 2022; Khalid & Strange, 2016; Pandian et al., 2022; Tuli & Bekele, 2020), with the ultimate goal of providing indicators for practitioners for PLC implementation. Although previous reviews have provided valuable contributions, their focus on certain variables is too specific (Msimanga et al., 2019; Zhang & Sun, 2020), with a holistic overview being rarely investigated, leaving a research gap in the literature. This gap makes it challenging for new researchers and interested readers stepping into the field (Hong et al., 2024; Zainal Abidin et al., 2023).

The purpose of the current study was to fill this gap by providing a holistic overview of PLCs in the contemporary context. To the best of our knowledge, there is no evidence of this work being duplicated so far, making our work a unique contribution. In this study, we focused on addressing the following research questions:

- RQ1: What is the publication trends of PLCs in the last five years (2019−2024)?
- RQ2: Which sources and contributions are most prominent in this line of research topic?
- RQ3: Where in the world do PLCs mostly take place?
- RQ4: What are the recent issues pertaining to PLCs that have drawn the attention of researchers?
- RQ5: What are the recent themes and how are they interrelated with respect to PLCs?

By addressing the aforementioned research questions, researchers, teachers, and educational administrators can attain a holistic understanding of the existing body of knowledge on teacher learning communities. This will consequently pave the way for exploring novel research avenues in the future. The rest of the paper

is organized as follows: Section 2 presents work related to our study. Section 3 outlines the chosen research methodology, with detailed description and justification. The results of the study are presented in Section 4, and a discussion is presented in Section 5. The paper is concluded in Section 6. Finally, current limitations and open research avenues are presented in Section 7.

2. Related Work

Reviews of PLCs have been extensively explored in educational research, addressing various dimensions and contexts. These studies collectively emphasize the multifaceted nature of PLCs, their effectiveness, and the challenges associated with their implementation. Stoll et al. (2006) provided a foundational review, examining PLCs across five dimensions: definition, effectiveness, creation and development processes, supportive factors, and sustainability. They highlighted the lack of consensus on the definition of PLCs and identified key features contributing to their effectiveness, including shared leadership and collaborative culture (Stoll et al., 2006; Tuli & Bekele, 2020). Similarly, Pandian et al. (2022) synthesized 27 publications and outlined 5 critical dimensions for effective PLCs: shared supportive leadership, shared values and vision, collective learning and application, shared personal practice, and supportive conditions. Both studies underscore the importance of collaborative practices and shared vision in enhancing PLC effectiveness (Pandian et al., 2022; Stoll et al., 2006).

Challenges in implementing PLCs have been a recurring theme in the literature. Jalaludin et al. (2022) and Chen (2020) identified several obstacles, including teacher motivation, administrative support, workload, and financial constraints. These challenges are echoed in other studies that emphasize the need for supportive conditions and continuous improvement (Pandian et al., 2022; Tuli & Bekele, 2020). The historical review by Chen (2020) on PLCs in China highlighted additional challenges, such as the top-down nature of PLC implementation and the scarcity of studies focusing on rural areas and long-term impacts.

In terms of teachers' innovation and competencies, Jalaludin et al. (2022) found that engaging teachers in collective lessons, classroom observation, and collaborative learning significantly enhances innovation. Concurrently, providing support, training, and teamwork opportunities improved teachers' competencies, a finding supported by Antinluoma et al. (2021) and Tuli and Bekele (2020). Studies in specific contexts, such as Malaysian primary and secondary schools, revealed unique themes and issues. Ishak et al. (2020) synthesized findings from 35 studies, identifying themes related to research methods, characteristics, practices, roles of learning institutions, and issues specific to the Malaysian context. Similarly, Khalid and Strange (2016) identified seven key themes in their review, including activities, knowledge, motivation, barriers, roles, benefits, and influential factors, reinforcing the complexity and multifaceted nature of PLCs. These themes align with broader findings on the characteristics and supportive conditions necessary for effective PLCs (Stoll et al., 2006; Tuli & Bekele, 2020).

Empirical studies further validate the positive impact of PLCs on teacher practices and student achievement. Doğan and Adams (2018) confirmed prior studies'

findings that PLCs enhanced both teacher practice and student outcomes. The role of leadership is a critical factor in the development and sustainability of PLCs. Antinluoma et al. (2021) emphasized that principals played a pivotal role in advancing schools as PLCs. Leadership changes could positively affect PLC progression, highlighting the importance of stable and supportive leadership in fostering effective PLCs (Antinluoma et al., 2021; Tuli & Bekele, 2020).

3. Methodology

To conduct the literature review, our study followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) review methodology (Moher et al., 2010). PRISMA provides a clear guideline for conducting a systematic review. As such, it plays a pivotal role for researchers, empowering them to evaluate the reliability of studies before incorporating them into their research (Hong et al., 2024; Nguyen & Thai, 2023). The primary focus of PRISMA is on generating detailed and reliable reports on the conduct and results of research, thereby aiding researchers in constructing a clear and objective information system. This robust method can be applied across various research fields, significantly enhancing the consistency and reliability of scientific articles (Moher et al., 2010).

3.1 Eligibility Criteria

Inclusion criteria: To be eligible for our analysis, articles had to satisfy the following criteria:

- Written in English
- Published between 2019 and 2024
- Published in a journal
- Be accessible for reading the whole content
- Be peer reviewed
- Content appropriate to our topic

Exclusion criteria: Articles that met the following criteria were excluded from our corpus:

- NOT written in English
- NOT published between 2019 and 2024
- NOT published in a journal (e.g., conference proceedings, magazines, book chapters)
- Content NOT accessible (e.g., subscription based)
- Content NOT peer-reviewed
- Content NOT appropriate

3.2 Information Sources

Our study utilized the Scopus database for the search and analysis of articles pertaining to PLCs. Scopus is a well-known repository for indexing academic papers (Singh et al., 2021). It encompasses a wide range of topics, including social sciences, engineering, and medicine. Compared to other indexing databases (e.g., Web of Science, Google Scholar, DOAJ, PubMed, PsycINFO, ERIC), Scopus has a specialized mechanism to perform an operational search. Furthermore, articles indexed in Scopus are peer-reviewed and, therefore, their content could be

considered reliable. Due to its powerful search function and convenience, Scopus has been utilized for searching reliable publications in many literature reviews (Hong et al., 2024; Nguyen et al., 2023; Zainal Abidin et al., 2023). In addition, 99.11% of journals indexed in Web of Science are also indexed in Scopus (Singh et al., 2021), so many studies have used Scopus as a single repository for conducting literature reviews (Chamorro-Atalaya et al., 2023; Hong et al., 2024; Zainal Abidin et al., 2023). Therefore, we employed Scopus only as a single source of information.

3.3 Search Criteria

Search criteria were employed to retrieve articles that had at least one term related to "learning communit*" and "teacher*" in the 'Article title' search field. After applying constraint criteria, our search operation on Scopus included the following: TITLE ("learning communit*" AND "teacher*") AND (LIMIT-TO (SUBJAREA , "SOCI")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (LANGUAGE , "English")). With this search query, Scopus returned 236 items. Data from January 2019 to March 25, 2024 were collected.

3.4 Study Selection

The study selection of our research involved two phases: the screening phase and the eligibility phase. In the screening phase, two independent researchers screened the titles, abstracts, and keywords of each article to assess their suitability. If there was a disagreement between the two researchers, a third researcher reviewed the article and cast the deciding vote. Similarly, in the second phase, full-text papers were read first by the two researchers, and in case of disagreement, the final judgment was made by the vote of all three researchers. After this phase, 27 eligible publications remained in our corpus.

Figure 1 illustrates the article selection process. Initially, the search query returned 236 records. After applying an additional filter based on year range, Scopus excluded 50 items. Subsequently, independent researchers screened the articles, resulting in 174 eligible papers based on their title, abstract, and keywords. Out of these, 14 articles were not accessible for full-text reading. The remaining 160 papers were manually examined by two researchers. After a thorough review, 27 papers were retained for further investigation.

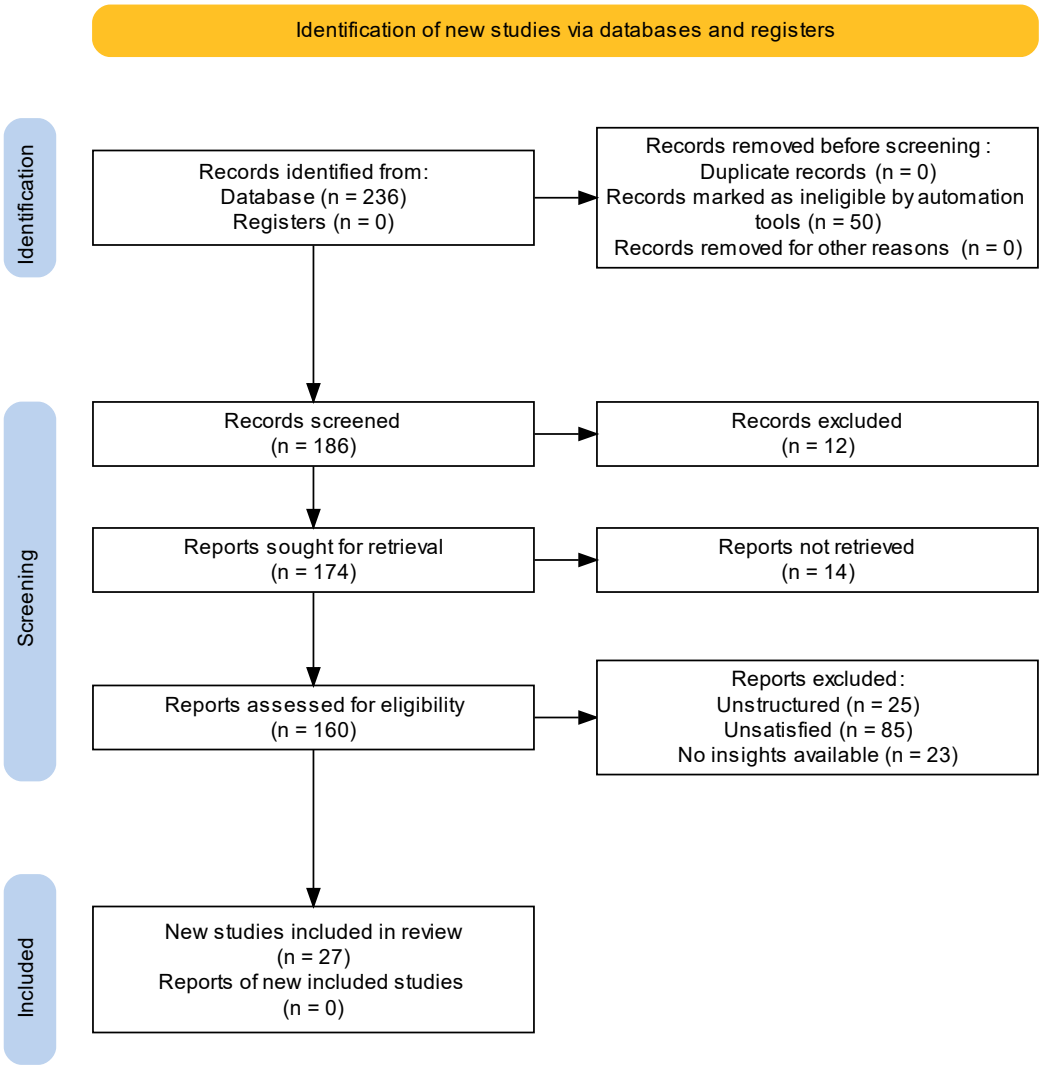

Figure 1: PRISMA flow diagram describing the article selection process

3.5 Data Collection Process

Two independent researchers collected variables for data analysis in a ratio of 14:13. Additionally, each researcher collected variables from five random papers from other researchers. If more than 85% of the variables matched in 10 overlapping papers, the variables extracted by each researcher were retained. If the match was less than 85%, a third researcher intervened to establish the rules for collecting variables, and the two researchers restarted the process. This iteration continued until the matching variables exceeded 85%. Variables extracted for the study included: author(s), title, year, source title (journal), cited by, affiliations, author keywords, challenges, and external data related to citations.

3.6 Data Items and Synthesis of Results

Data were saved in comma-separated values (.csv) format, as it is compatible with most software. Our study utilized three tools to synthesize data items: Microsoft Excel for aggregating data and generating charts such as line and bar charts, VosViewer for creating keyword networks and cluster formations, and WordCloud for generating word clouds.

4. Results

4.1 Publication Trends of PLCs in the Last Five Years (2019–2024)

Error! Reference source not found. presents an overview of the distribution of the selected peer-reviewed papers from 2019 to 2024. A total of 27 publications are projected, showing an uneven distribution of scientific articles across the different years. Overall, the number of publications on PLCs exhibited an upward trend from 2019 to 2023, reaching a peak of seven publications in 2023. However, there was a decrease in the number of papers published in 2021, with only three papers. The number of publications on PLCs rebounded in 2022, with six papers, and slightly increased in 2023, reaching seven papers. As for 2024 (until March), only one article had been published, and it was premature to assess whether there would be a decrease or not, as the year had not yet been concluded at the time of this investigation. However, this information indicates that the topic continues to receive interest and research attention in the future.

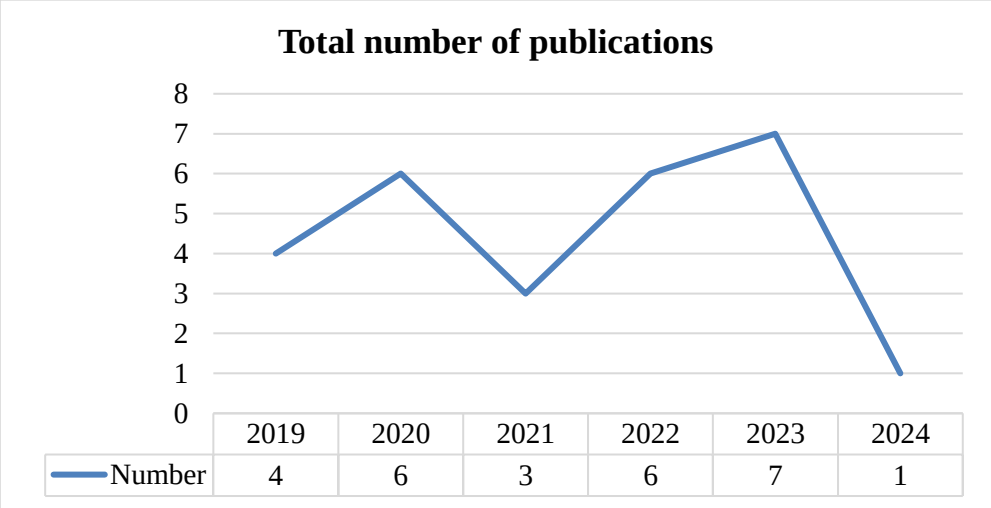

Figure 2: Distribution of selected publications from 2019 to 2024

4.2 Most Sources and Contributions on the Topics of PLCs

Error! Reference source not found. presents data on the journals that published the 27 analyzed articles on PLCs. Overall, the journal *Teaching and Teacher Education* stood out as the most prominent contributor, publishing a total of five articles on PLCs. In second place was *Professional Development in Education*, with four articles published in the study period. The *International Journal of Management in Education* and the *South African Journal of Education* ranked third, each having published two articles. The remaining journals exhibited a comparable number of published articles.

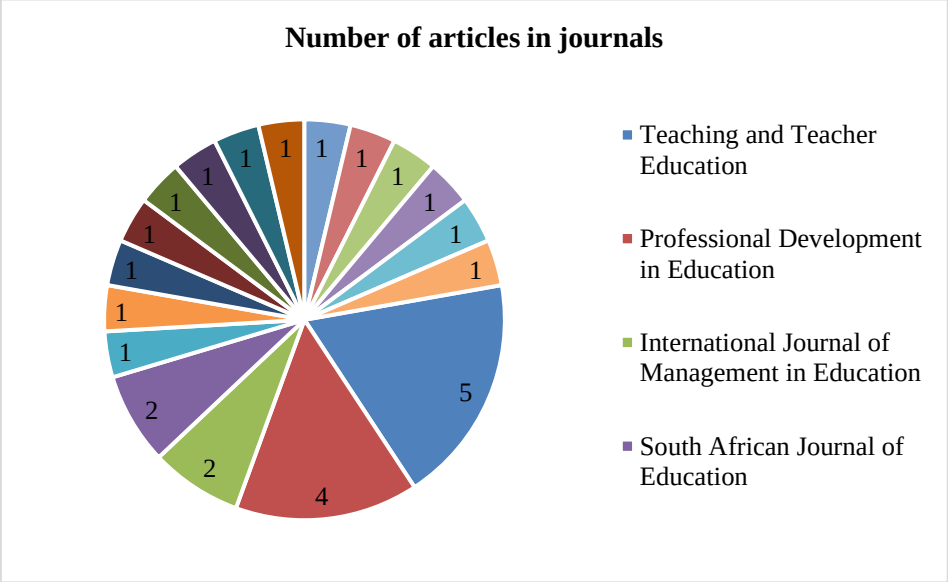

Figure 3: Journals containing articles on PLC research

Table 1 presents the top 10 most influential articles pertaining to PLCs with respect to the number of citations.

Table 1: Top 10 articles on PLCs by citation count

No	Title	Citation count
1	Professional learning communities count: Examining the relationship between faculty trust and teacher professional learning in Hong Kong kindergartens (Yin et al., 2019)	39
2	Transformational leadership, professional learning communities, teacher learning and learner centred teaching practices: Evidence on their interrelations in Mozambican primary education (Luyten & Bazo, 2019)	36
3	Tensions experienced by teachers when participating in a professional learning community (Schaap et al., 2019)	22
4	Can professional learning communities promote teacher innovation? A multilevel moderated mediation analysis (Liu et al., 2022)	21
5	Teacher agency in professional learning communities (Brodie, 2021)	21
6	A historical review of professional learning communities in China (1949−2019): Some implications for collaborative teacher professional development (Chen, 2020)	19
7	The relationships among transformational leadership, professional learning communities and teachers' job satisfaction in China: What do the principals think? (Zhang et al., 2022)	13
8	The role of professional learning communities to support teacher development: A social practice theory perspective (Feldman, 2020)	13
9	Principal leadership practices, professional learning communities, and teacher commitment in Hong Kong kindergartens: A multilevel SEM analysis (To et al., 2023)	9
10	Implementing professional learning community in rural Malaysian primary schools: Exploring teacher feedback (Tahir & Musah, 2020)	5

The article titled "Professional learning relationships count: Examining the relationship between faculty trust and teacher professional learning in Hong Kong kindergartens" (Yin et al., 2019) published in the journal *Teaching and Teacher Education* garnered the highest attention from scholars in this field, with 39 citations from Scopus (Google Scholar recorded 73 citations). Following closely is the article titled "Transformational leadership, professional learning communities, teacher learning, and learner-centered teaching practices: Evidence on their interrelations in Mozambican primary education" (Luyten & Bazo, 2019) published in the journal *Studies in Educational Evaluation*, with 36 citations (Google Scholar recorded 125 citations). Other notable articles (e.g., Brodie, 2021; Chen, 2020; Liu et al., 2022; Schaap et al., 2019) also made significant contributions to this field, with citation counts ranging from 19 to 22. The remaining articles on the list had citation counts ranging from 5 to 13 (Feldman, 2020; Tahir & Musah, 2020; To et al., 2023; Zhang et al., 2022).

Upon conducting a thorough analysis of the selected articles, it became apparent that teacher learning communities have garnered considerable attention from numerous authors. The most cited article investigated the relationship between teachers' beliefs about learning communities and their professional development, accumulating 39 citations. Quantitative research findings indicate that teachers' perceptions of trust from colleagues, parents, and principals significantly influence their professional learning experiences in kindergartens, with learning communities playing a mediating role (Yin et al., 2019). The second most influential article in terms of citation count (Luyten & Bazo, 2019) underscored the significance of transformational leadership and PLCs within the African context. Through interviews, Schaap et al. (2019) delved into the challenges teachers encounter while participating in PLCs. The characteristics of successful learning communities were identified, along with three factors pertaining to teacher agency within the learning community: community participation, community inhibition, and community rejection. In addition, Liu et al. (2022) determined the moderated relationships between four constructs: PLC, teacher creativity, teacher innovation, and professional climate.

Based on the aforementioned research findings, it becomes evident that teacher learning communities have captured the interest of various stakeholders due to their profound impact, influence, and value in supporting teachers' professional development and educational advancement. Continued research and the ongoing development of teacher learning communities have contributed to establishing an optimal environment for teachers' continuous professional growth, thereby enhancing the overall quality of education.

4.3 Countries which Conducted Research on PLCs

Figure 4 presents data on the countries that participated in research on PLCs.

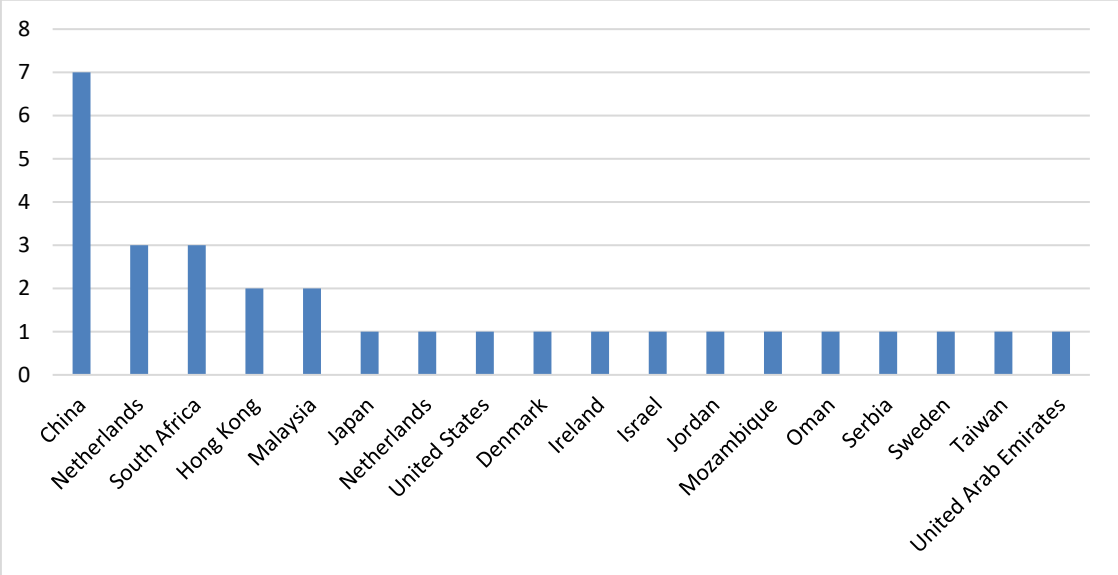

Figure 4: Active countries in conducting research in PLCs

The data presented in **Error! Reference source not found.** show that of the 27 selected articles pertaining to PLCs, China had the highest number of published articles, with a total of 7 publications. The Netherlands and South Africa ranked second, each contributing three publications, followed by Hong Kong and Malaysia, with two articles each. The remaining countries contributed one scientific article each in this area. These findings provide valuable insights for researchers, educators, and administrators in the education sector, shedding light on the growing importance of teacher learning communities in the 4.0 era. However, further in-depth research is necessary to enhance the quality of activities within teacher learning communities and create an optimal environment for their professional development.

4.4 Recent Issues Pertaining to PLCs Drawing the Attention of Researchers

Table 2 presents the issues pertaining to PLCs that drew the attention of the researchers of the selected studies. Notable attention was primarily focused on analyzing the influence of leadership within PLCs. Specifically, these studies explored the role of leadership in promoting collaboration, fostering motivation, and creating an enabling environment for teachers' professional development (Chen & Zhang, 2022; Grimm, 2023; Luyten & Bazo, 2019; To et al., 2023). Additionally, research was conducted to identify factors that can facilitate or hinder the functioning of teacher–learning communities, including the cultural environment, training programs, and support from various stakeholders (Pandian et al., 2022; Shdaifat, 2020; Tahir & Musah, 2020). Furthermore, scholarly investigations explored the impact of trust in establishing and sustaining PLCs. This includes examining trust in oneself, trust in colleagues, and trust in the learning process (Ninković et al., 2022; Yin et al., 2019). Researchers also assessed teachers' attitudes toward participating in and contributing to learning communities. This encompassed positive and negative attitudes and perceptions

regarding the significance of learning communities, as demonstrated in several empirical studies (Chen, 2022; Tai & Omar, 2023).

Table 2: Prior issues investigated by scholars

Prior research topics	References
The role of leadership in the teacher−learning community	(Chen & Zhang, 2022; Grimm, 2023; Luyten & Bazo, 2019; To et al., 2023)
Favorable factors and limitations for the activities of the teacher–learning community	(Pandian et al., 2022; Shdaifat, 2020; Tahir & Musah, 2020)
The influence of trust on teachers' professional learning communities	(Ninković et al., 2022; Yin et al., 2019)
The relationship between teachers' attitudes toward the learning community	(Chen, 2022; Tai & Omar, 2023)
The issue of ethical training and integration of teachers in the learning community	(Brennan & Gorman, 2023; Keijzer et al., 2020)
The stress and pressure of teachers when participating in the learning community	(Schaap et al., 2019; Shauly & Avargil, 2023)
Learning community and collaboration in teachers' professional development	(Chen, 2020; de Jong et al., 2021)
The role of learning communities in teachers' continuous professional development	(Mo et al., 2021; Zulu & Mukeredzi, 2021)
The role of social platforms for teachers' professional learning community	(Elfarargy et al., 2022; Zhou et al., 2022)
Professional learning communities and teacher innovation	(Al-Yahmadi, 2023; Liu et al., 2022)
The influence of teacher learning communities on student learning outcomes	(Dahl, 2019; Liu & Yin, 2024)
How teacher–learning communities operate	(Brodie, 2021; Feldman, 2020)

In addition, the process of moral training and the integration of teachers into learning communities were investigated (Brennan & Gorman, 2023; Keijzer et al., 2020). This involved cultivating moral values and identifying strategies to adapt to the learning community environment. Moreover, researchers examined the stress and pressures experienced by teachers when engaging in learning communities. This included time constraints, workload pressures, and assessment-related challenges (Schaap et al., 2019; Shauly & Avargil, 2023). Collaboration became a central theme in teachers' professional development within learning communities. It encompassed sharing knowledge, exchanging experiences, and providing support to colleagues. Such collaborative efforts contribute to teachers' continuous professional growth and improvement (Chen, 2020; de Jong et al., 2021). Notably, research focused on how learning communities create conducive learning environments and facilitate knowledge sharing among teachers. Furthermore, scholarly investigations examined the impact of social platforms and social networks on teacher PLCs. These studies explored how teachers leverage social platforms to share knowledge, foster relationships, and engage in collaborative professional development practices.

The effects of PLCs on teacher innovation have been extensively studied (Al-Yahmadi, 2023; Liu et al., 2022). These investigations delved into how learning communities inspire teachers to experiment with and implement novel teaching

methods, thus enhancing teaching processes and yielding positive student learning outcomes. Moreover, the influence of teacher learning communities on student learning outcomes has been a subject of inquiry (Dahl, 2019; Liu & Yin, 2024). These studies examined how teacher learning communities facilitate knowledge sharing, foster collaboration among teachers, and create an active learning environment that benefits students. Furthermore, research analyzed the operational, organizational, and managerial aspects of learning communities (Brodie, 2021; Feldman, 2020). This included exploring the structure, processes of participation, and activities within learning communities, all with the aim of establishing an effective and positively interactive learning environment for all members involved.

4.5 Recent Themes and Their Relationships Pertaining to PLCs

Error! Reference source not found. presents a visualization of the research network on learning communities from 2019 to 2024, utilizing VosViewer software. The mapping results revealed the existence of six primary clusters (or themes) representing different topics of study. The formation of clusters in VosViewer was primarily based on the co-occurrence relationships among items, such as keywords, authors, or publications. In this analysis, clusters were formed based on keywords

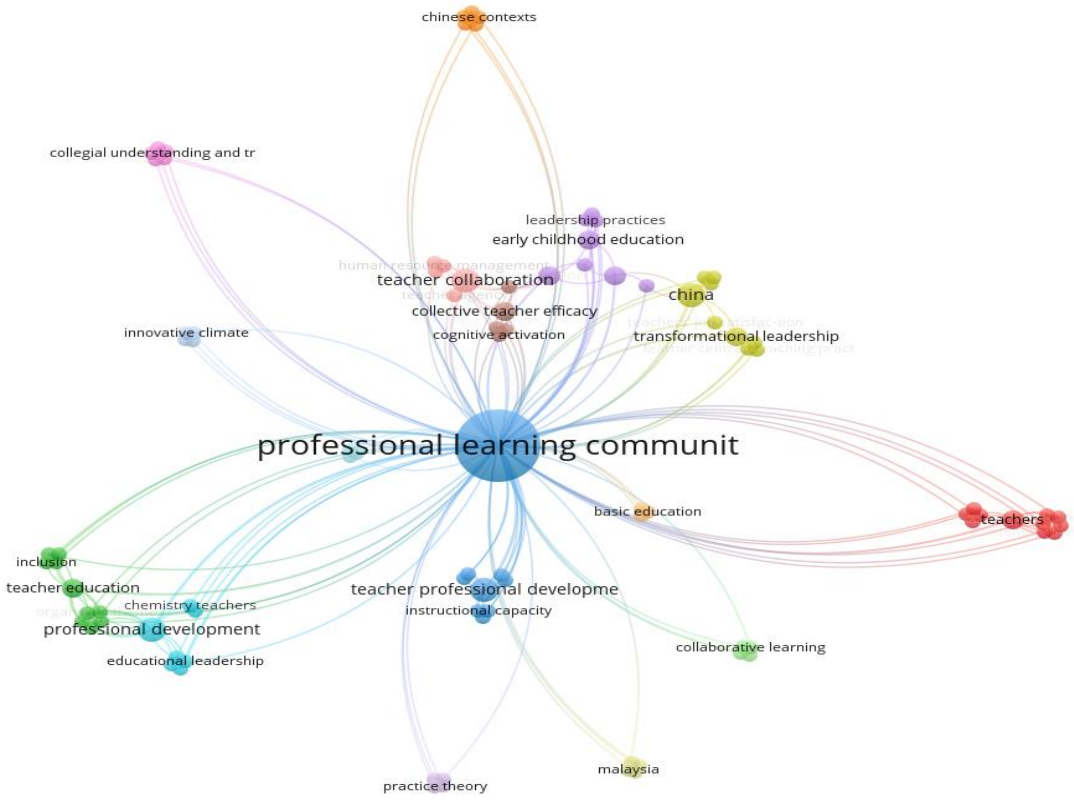

Figure 5: Network of keywords pertaining to PLCs

The first cluster (encoded as blue) stood out as the largest, highlighting the interrelationships between keywords. At its core was the term "professional learning community", which was closely associated with all other keywords in

our corpus. This indicates our focus on exploring PLCs. The study of teacher PLCs emphasized their contribution to enhancing teacher collaboration, promoting teacher innovation, and improving collective teacher efficacy. Furthermore, the cluster highlighted the positive association between PLCs and student academic achievement, as evidenced by multilevel structural equation models. The analysis also investigated the obstacles that hinder teachers' professional development and demonstrated how teachers can support each other within the learning community. One significant motivating factor for teachers to join learning communities was the realization of their necessity and benefits, particularly in the context of integration trends and the 4.0 revolution. Overall, the PLCs served as a key avenue for teachers to enhance their teaching capacity, engage in collaboration, and pursue professional growth.

Next, the second cluster (encoded as red) primarily focused on examining issues related to teachers within PLCs, with an emphasis on psychological factors. Trust emerged as a crucial element influencing teachers' attitudes and performance within the learning community.

Most of the terms in the third cluster (encoded as green) focused on issues related to teacher professional development. It revealed the relationship between "learning communities" and "teacher professional development", suggesting that participation and interaction within learning communities can promote teachers' professional growth. Additionally, "learning communities" was associated with "leadership", underscoring the crucial role of leadership in establishing and fostering learning communities, facilitating interaction, and supporting professional development. Moreover, "learning communities" was linked to "teacher training", indicating that learning communities serve as an effective method for teacher training, offering opportunities for learning and professional growth.

Leadership could be considered as the theme of the fourth cluster (encoded as purple). This cluster explored the principal's role in cultivating teacher learning communities. The interrelationship between keywords within this cluster highlighted the connection between "learning communities" and "leadership practice". This signifies that effective leadership practices are vital in creating a positive environment, encouraging interaction, and fostering collaboration among community members. Learning communities could also serve as an effective approach for Early Childhood Education training, facilitating the professional development of teachers and professionals in the field. Furthermore, "learning communities" was associated with "reconciliation" and "conflict", indicating that learning communities can aid in conflict resolution and reconciliation within the community, thereby enhancing community performance.

The fifth theme (encoded as orange) drew attention to teacher collaboration within learning communities. The network depicts the relationship between "learning communities" and "teacher collaboration". Collaboration within learning communities encompasses the sharing of knowledge, experiences,

thoughts, and effective teaching methods. Through collaboration, teachers can support and complement each other, create a positive learning environment, and work toward common goals. Additionally, "learning communities" is connected to "collective teacher effectiveness", highlighting that the development and participation of teachers in learning communities can ensure and enhance collective teacher effectiveness—the ability to collaborate and achieve positive outcomes in teaching and learning. Learning communities provide a platform for knowledge sharing, idea exchange, and the creation of opportunities for learning and professional development among teachers.

The final theme (encoded as yellow) paid attention to the intersection of transnational leadership and learning communities. Transnational leadership plays a significant role in the establishment and advancement of learning communities. It provides guidance, strategies, and resources to cultivate a positive learning environment and promotes interaction within a global, inclusive learning community. Collaboration among members from different countries is emphasized. China stood out as a country that plays a crucial role in the development and promotion of learning communities through its policies, priorities, and resource allocation.

In general, the visual network prominently displays the phrase "professional learning communities" across multiple domains. It was interconnected with other keywords such as "teacher education", "teacher learning", "teacher trust", "professional development", "teacher commitment", "teacher agency", "teacher collaboration", "transformational leadership", "teacher anxiety", "teacher job satisfaction", and "teacher pedagogy". These relationships highlight the interconnections between these concepts. Additionally, keywords such as "online communities", "WeChat", "online learning communities", and "social theory of learning" were associated with "professional learning communities", indicating the interaction between online learning communities and teacher professional development. Furthermore, keywords such as "school organization", "school education", "students' mathematics achievement", "public schools", and "vocational education" were mentioned in the context of "professional learning communities", demonstrating the linkages between school organization, student academic achievement, and career education.

Figure 6 illustrates a word cloud representing the relative frequency of keywords in descending order, ranging from the most frequently occurring (largest size) to the least frequently occurring (smallest size). The research findings and image analysis indicate that the extracted keywords from the 27 articles related to teacher learning communities primarily revolve around the themes of learning, community, professional, and teacher. The keyword "learning" appeared most frequently, occurring 38 times, followed by "professional" with 35 occurrences, "communities" with 29 occurrences, and "teacher" with 18 occurrences across the 27 analyzed articles.

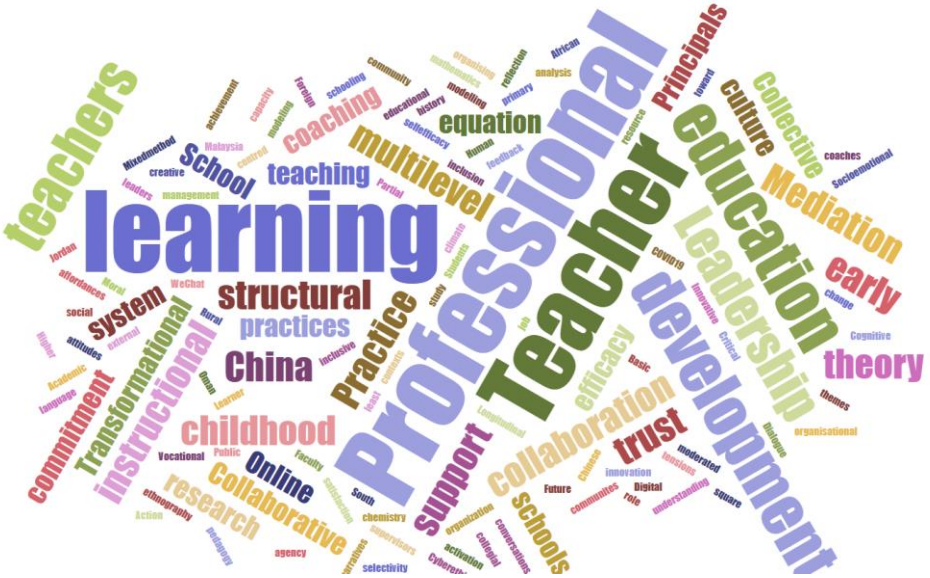

Figure 6: Wordcloud with keywords extracted from the abstracts of the 27 selected publications

These results highlight the significant interest in various aspects of learning within teacher communities, emphasizing the importance of continuous learning and professional development through PLCs. These communities hold a crucial role, providing teachers with a diverse and effective environment to enhance their professional skills and qualities. Additionally, other keywords such as "education", "development", and "leadership" also appeared frequently, indicating their relationship with the PLCs of teachers and the potential solutions associated with this topic. These solutions were designed to aid teachers in actively engaging in learning communities and maximizing their personal professional development.

5. Discussion

Compared to previous literature reviews on PLCs (Ishak et al., 2020; Pandian et al., 2022; Stoll et al., 2006; Tuli & Bekele, 2020), our study shared common features, while some results also differed. First, in terms of methodological approaches, our study shared the same method than Pandian et al. (2022), who clearly indicated utilizing PRISMA methodology, while other reviews did not clearly describe their selection process. Second, in terms of the results, our findings can only be comparable to the work of Ishak et al. (2020) pertaining to PLCs. This is because only one variable (publication trend) was investigated in both studies. Other variables did not overlap for direct comparison. We subsequently discuss the findings and their implications.

In terms of the publication trends, the data revealed a fluctuating pattern in the number of scientific articles published between 2019 and 2024 pertaining to PLCs. The downward trend from 2021 to 2022 could be attributed to several factors, such as Covid-19 pandemic impact, burnout and workload, or technological adaption (Nadin, 2023). Overall, there was an upward trend in the number of publications on PLCs, indicating a growing interest among researchers in this field. Compared

to the results of Ishak et al. (2020), our work exhibited a similar pattern of upward trend, fluctuation, and the range of publication number (max. of 7 publications/year). However, there was one notable difference between our study and that of Ishak et al. (2020). While the collection timeframe of the previous study was from 2009 to 2018, the timeframe of our data was from 2019 to 2024, meaning that our results could complement previous work to enrich the literature. This partially answers the question of PLC sustainability posed by Stoll et al. (2006) since 2006.

The analysis depicted in Figure 3 revealed *Teaching and Teacher Education* as the prominent contributor in publishing articles on PLCs, followed closely by *Professional Development in Education*. This pattern may be attributed to several factors. One possible factor could be the scope of these two journals that primarily focuses on teacher preparation, training, and development. Another factor may be the quality of the journals (Scopus indexed), thus attracting many researchers. Journal ranking could also be a promising indicator for attracting researchers, because a higher impact factor could lead to a higher number of citations. Analysis of the citation count in Table 1 shows that both articles #1 and #4 were published in *Teaching and Teacher Education*, thus supporting our assumptions. Our findings, however, deviated from the findings of Pan et al. (2023), who found that "more articles" was not the reliable predictor of "more impact". After investigating how the #1 influential paper was cited in Semantic Google, we found that for 80% of the times the paper was cited, it was cited in the background or introduction section, indicating a high level of generalization.

In terms of recent issues pertaining to PLCs, our findings are consistent with previous work (Pandian et al., 2022; Stoll et al., 2006), where leadership's role in fostering collaboration, motivation, and an enabling environment for professional development was a key focus. One plausible explanation can be the intrinsic influence that leaders have in shaping the culture and dynamics of PLCs (Grimm, 2023; Luyten & Bazo, 2019; To et al., 2023). Factors that facilitated or impeded learning communities, such as cultural environment, training programs, and stakeholder support, were also investigated. Trust, including self-trust, trust in colleagues, and trust in the learning process, was explored for its impact on establishing and sustaining communities. Attitudes toward participation and contribution, moral training, and integration into communities were studied. Stressors such as time constraints and workload pressures were examined, and collaboration was emphasized for knowledge sharing, experience exchange, and support among colleagues. The impact of social platforms and networks on PLCs was explored, highlighting their use for knowledge sharing and collaborative development. The effects of learning communities on teacher innovation and student outcomes were extensively examined, demonstrating their influence on teaching methods and active learning environments. Additionally, the research delved into operational, organizational, and managerial aspects to establish effective and interactive environments.

5.1 Theoretical Implications

The observed publication trends from 2019 to 2024 provided valuable insights into the sustainability and evolution of research on PLCs. By extending the timeline of

previous studies (i.e., Ishak et al., 2020), we enriched the historical context and offered a more comprehensive view of how PLC research has developed over time. The fluctuation in publication numbers highlighted the significant impact of external factors on academic productivity. These findings suggest that future theoretical frameworks should consider the role of external disruptions in shaping research trajectories and productivity. Additionally, the sustained upward trend in PLC publications indicated a growing interest and ongoing relevance of PLCs in the academic community (Stoll et al., 2006). The pattern from prominent journals highlighted the journal scope and quality in attracting research contributions, suggesting that journals with a strong emphasis on educational development and high impact factors are likely to garner more submissions from researchers. The diverse recent issues in our study imply that prospective theoretical frameworks should consider these factors when validating or building new assumptions. Analysis of network clusters in the visual map showed the centrality of "professional learning communities" in closely linking with keywords such as "teacher education", "teacher learning", "teacher trust", "professional development", and "transformational leadership". This suggests that effective PLCs are not just about collaboration but also encompass aspects of trust, commitment, and leadership, which are critical for fostering an environment conducive to professional growth and job satisfaction.

5.2 Practical Implications

The upward trend in PLC research underscores the importance of continued investment in PLC-related initiatives and professional development programs. Policymakers and educational leaders can use these insights to justify funding allocations and support for research that fosters collaborative learning environments. The high ranking and quality of the influential journals suggest that researchers aiming for higher visibility and impact should consider targeting their submissions to well-regarded, Scopus-indexed journals within their field. Moreover, understanding that citations to highly cited papers often appear in the background or introduction sections of other works emphasizes the need for researchers to ensure that their studies are broad and generalizable to maximize their impact. For educational institutions and policymakers, these findings underscore the importance of supporting research and professional development initiatives that align with the standards of high-quality journals. This alignment can enhance the visibility and influence of their research outputs, contributing to the broader discourse on teacher education and professional development. The exploration of 12 recent issues implies that educational institutions can prioritize leadership training and development to enhance the effectiveness of PLCs. When performing network analysis, the prominent role of PLCs in linking various aspects of teacher development suggests that educational institutions should prioritize the creation and support of PLCs to foster a holistic approach to professional growth. Leadership training should be emphasized, equipping school leaders with the skills necessary to build trust, facilitate collaboration, and manage transformational changes effectively.

5.3 Limitations of the Current Study

Several limitations should be considered regarding this study. First, the reliance on the Scopus database for data collection might have resulted in the exclusion of relevant articles from other databases or sources. Second, the study timeframe (January 2019 to March 2024) may have limited the inclusion of more recent research, potentially overlooking emerging trends or developments in the field. Additionally, the focus on article counts, countries, number of citations, and keywords may have led to overlooking other important factors, such as the quality or depth of the research. Finally, the generalizability of the findings may be limited, as the analysis is based on a specific set of articles and may not fully represent the entire landscape of teacher PLCs.

6. Conclusion and Future Work

This research aimed to analyze articles pertaining to teacher learning communities published within the Scopus database between 2019 and 2024. The findings of this study demonstrate a growing interest in teacher learning communities, as evidenced by the increasing number of new articles in this field. The journal *Teaching and Teacher Education* emerged as the top publisher of articles related to learning communities. Notably, the article titled "Professional learning communities count: Examining the relationship between faculty trust and teacher professional learning in Hong Kong kindergartens" (Yin et al., 2019) held the most influence, with 39 citations. Furthermore, the study revealed that China is a prominent contributor to research on PLCs. Keywords such as learning, professional, community, and teacher frequently appear in articles within this field. The study findings offer valuable insights for future research as they help to identify topics that have been addressed by previous scholars and shed light on existing gaps in the research landscape.

Based on the research findings, it is recommended that the following areas be the point of focus for future study and practice. First, further research should be conducted to explore effective leadership practices within PLCs, with a specific emphasis on promoting collaboration and creating an enabling environment for professional development. Second, interventions aimed at building trust among teachers should be developed and implemented, considering the importance of trust in establishing and sustaining learning communities. Lastly, addressing the challenges faced by teachers, such as time constraints and workload pressures, is crucial to enhance the functioning and effectiveness of learning communities. By addressing these recommendations, educators and researchers can contribute to the continuous improvement of PLCs and promote the growth and sustainable development of teachers.

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