The impact of continuous professional development on teaching quality: a systematic review

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Article Info

ABSTRACT

This article explores the impact of continuous professional development (CPD) on teaching quality. The article provides a comprehensive overview of CPD, focusing on pedagogical skills, classroom problem-solving abilities, and the mediating role of leadership within educational institutions. This study used PRISMA approach by analyzing 2,432 English-language publications from 2023 to 2024 taken from the Scopus, Web of Sciences (WoS), and ERIC databases. The data were collected, reviewed, and underwent a peer-review process before a systematic literature review. This article synthesizes findings from final articles (n=24) into five main themes: student perceptions and teaching quality, professional development (PD) and teacher learning, role of leadership in teacher development, assessment and evaluation in teaching, and collaboration and community in teaching. The review reveals that CPD significantly enhances teaching quality by improving pedagogical skills and problem-solving capabilities in the classroom. Furthermore, leadership within educational institutions plays a crucial role in facilitating the positive effects of CPD on teaching quality. By fostering an environment that supports PD, collaborative learning, and reflective practice, educational leaders can amplify the benefits of CPD. This study contributes to the understanding of how CPD and effective leadership together can elevate teaching standards and outcomes, offering valuable insights for policymakers, educators, and academic leaders aiming to enhance educational quality through PD.

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1. INTRODUCTION

The quality of teaching continues to be crucial in determining the learning experiences and outcomes of students in a rapidly transforming educational landscape [1]–[3]. In the context of these challenges, continuous professional development (CPD) emerges as a vital tool for improving academic standards and teaching effectiveness. This article explores how CPD might improve teaching quality and makes the point that in order for teachers to effectively traverse the complexities of contemporary pedagogies and student needs, they must engage in continuous, reflective, and structured professional development (PD) [4], [5].

It is impossible to overstate the importance of CPD in the field of education [6]–[8]. It acts as a catalyst for the development of an innovative and continuous improvement culture in teaching practices, in addition to being a means of keeping teacher expertise and skills up to date [9]. Participating in CPD makes teachers more

capable of putting evidence-based practices into practice, adapting to shifting learning environments, and successfully meeting the requirements of students from various backgrounds [10]. As a result, CPD plays a critical role in fostering teacher self-efficacy, work satisfaction, and ultimately academic success for students [11]–[13].

This article aims to explore the multifaceted connection between CPD and teaching quality by means of a comprehensive review of current research and empirical data. It aims to provide important answers to issues about the barriers to implementing CPD successfully, and measurable effects of CPD initiatives on teaching and learning, focusing on pedagogical skills, classroom problem-solving abilities, and the mediating role of leadership within educational institutions [14]. Additionally, it looks at how CPD integrates into global educational institutions and what that means for policy [15]–[17]. This article contributes to a greater understanding of how CPD affects teaching quality by synthesizing current research and practices. It also provides recommendations for policy makers, teachers, and institutions on how to fully utilize CPD. By doing this, it emphasizes how important it is to maintain a commitment to PD as a foundation for innovation and success in teaching [18].

In response to the issue of how CPD affects teaching quality, new research emphasizes how important it is for teachers to constantly improve their teaching skills to meet changing classroom demands and improve student achievement. Okumu and Opio [19] highlight that CPD is essential in helping teachers to critically examine problems in the classroom and create practical solutions, which greatly enhances their pedagogical abilities in secondary education. Similarly, Minică *et al.* [20] discuss the significance of educational institutions in offering chances for CPD stating that a cooperative and encouraging school environment improves teacher motivation, quality of education, and job satisfaction. These results highlight the crucial part that CPD plays in creating an atmosphere where teachers can learn new skills, gain confidence, and eventually improve the standard of teaching. Restructuring school policies and procedures to facilitate these chances for ongoing education, while ensuring that teachers have access to the tools, they need for CPD, is the problem.

In the context of Malaysia, when CPD is aligned with the national educational goals specified in the Malaysia Education Blueprint (2013–2025), a significant problem statement arises. According to study by Said *et al.* [21], school principals play a critical role in improving the standard of the teaching profession as professional learning leaders. According to their research, there is a strong relationship between the professional learning outcomes at the boarding schools in South Malaysia, teachers' self-efficacy, and the role of administrators as professional learning leaders. The results indicate that although the goal of CPD is to improve teaching quality, the effectiveness of these programs mostly depends on the leadership of educational institutions and the empowerment of teachers through higher levels of self-efficacy.

In conclusion, even though CPD has the potential to improve teaching quality, problems with challenges in classroom demands, cooperative and encouraging school environment and the effectiveness of CPD programs limit its efficacy [22]–[26]. To guarantee that CPD realizes its potential as a catalyst for educational success, policy makers, administrators and teachers must work together to address these issues, therefore, through exploration and understanding of various research perspectives, this study aims to answer two main research questions (RQ) as: i) how does CPD influence the pedagogical skills and classroom problem-solving abilities to improve teaching quality? (RQ1); and ii) what role does leadership within educational institutions play in mediating the relationship between CPD and teaching quality? (RQ2).

In our effort to address these RQs, we analyzed research evidence on this topic by conducting a bibliometric analysis of 2,432 English-language publications from 2023 to 2024 taken from the Scopus, Web of Sciences (WoS), and ERIC databases. The purpose of this analysis is to deeply understand the patterns, methodologies, theoretical foundations, leading journals, leading countries, and specific topics in this field of research [27]. This research examines a collection of studies on the impact of CPD on teaching quality.

2. METHOD

The authors begin this section with an explanation of the preferred reporting items for systematic reviews and meta-analyses (PRISMA) publication standard. The authors then provide detail on how the RQ were developed, the identification, screening, and eligibility methods of systematic searching they used, how to determine their quality, and how to gather and analyses data.

2.1. PRISMA

This comprehensive review was guided by the PRISMA publication standard. PRISMA helps authors define inclusion and exclusion criteria, develop RQ that facilitate systematic reviews, and try to sift through an enormous quantity of scientific literature in a short period of time [28]. In the current case, the authors' thorough keyword searches on the impact of CPD were directed by PRISMA. After that, authors classified the data for use in teaching quality.

2.2. Formulation of research questions

As it will guide the systematic review technique, the study must first identify a relevant research topic. Since the main objective of this study was to provide a comprehensive, in-depth analysis of the present state of the literature on the impact of CPD, the following RQ were selected: how does CPD influence the pedagogical skills and classroom problem-solving abilities to improve teaching quality? What role does leadership within educational institutions play in mediating the relationship between CPD and teaching quality? The article's emphasis changed from a crucial role of CPD on teaching quality of teachers to improve student achievement after the research question was defined.

2.3. Systematic searching strategy

2.3.1. Identification

The process of identification is employed to enhance the essential keywords. This is significant since the identification process increases the likelihood that additional relevant research will be located for the review [28]. Following the selection of a few keywords, related terms are located by searching dictionaries, thesaurus, encyclopedias, and past research. During the creation of the search strings for the databases of Scopus, WoS, and ERIC, all relevant phrases were chosen as presented in Table 1. During the first stage of the systematic review process, 2,432 publications were successfully extracted from the databases for the current study.

Table 1. The search string used for the systematic review process

Database	Search string
Scopus	("Continuous Professional Development" OR cpd OR "Professional Learning Community" OR "Teacher Development") AND ("Teaching Quality" OR "Educational Quality") AND PUBYEAR > 2022 AND PUBYEAR < 2025 AND (LIMIT-TO (SUBJAREA , "SOCI")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (PUBSTAGE , "final"))
WoS	TS=(("Continuous Professional Development" OR cpd OR "Professional Learning Community" OR "Teacher Development") AND ("Teaching Quality" OR "Educational Quality"))
ERIC	("Continuous Professional Development" OR cpd OR "Professional Learning Community" OR "Teacher Development") AND ("Teaching Quality" OR "Educational Quality") pubyearmin:2023

2.3.2. Screening

The aim of the screening process is to ensure that the materials being collected for a potentially relevant study are appropriate for the chosen research topic or topics. A frequent content-related criterion used in the screening process involves categorizing research materials according to the impact of CPD on teaching quality of teachers. The list of papers that were searched during this phase will be reviewed to remove any duplicates. After 2,432 publications were eliminated in the first screening stage, 187 publications were chosen for review in the second screening stage based on the investigation's exclusion and inclusion criteria as presented in Table 2. This criterion was selected before any others since helpful guidance can usually be found in research articles. It also includes meta-synthesis, book analyses, book series, and book reviews.

Table 2. The inclusion and exclusion criteria

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	Between 2023-2024	2022 and earlier
Literature type	Journal (research article)	Journals (systematic review), book series, book, chapter in book, conference proceeding
Subject/research area	Education, social science	Others
Publication Stage	Final	In press

2.3.3. Eligibility

There are 184 items ready for the eligibility phase, which is the third step. At this phase, the titles and main points of each article were carefully examined to make sure the articles met the inclusion requirements and the goals of the current study. 160 articles were therefore eliminated because they were either out of field, their full text access articles were not substantiated by empirical data, or their titles had no bearing on the purpose of the study. At last, 24 articles are accessible for examination as presented in Figure 1.

2.4. Appraisal of quality

The quality of the selected articles was evaluated using the mixed method appraisal tool (MMAT) version 2018 as the review was based on mixed research designs (quantitative + qualitative + mixed methods)

[29]. Two reviewers were assigned with assessing the quality of the selected articles based on the appropriateness of the statistical analysis conducted to achieve the objective, sampling, clarity of the RQ, and level of confidence in the evaluation of the research question. The reviewers also looked at how the data were interpreted in the papers and how the findings were presented, debated, and concluded. The quality was determined using the MMAT standards; 25% of the articles were rated as low-quality, 50% as medium, 75% as above average and 100% as high-quality. The 6 articles were above average, and the reviewers classified the remaining 18 as high average quality. The reviewers then categorized 18 articles as having high average quality while the remaining 6 were above average.

2.5. Data abstraction and analysis

An integrative analysis, which combined and examined multiple research types using quantitative methodologies, was one of the evaluation processes used in this study. The main objective was to conduct a thorough study with the aim of identifying pertinent topics and subtopics. The initial round of data collection marked the start of the theme development process. Figure 1 illustrates the authors' comprehensive analysis, which included a methodical evaluation of 24 publications to extract statements or content relevant to the main topics of the study. The important research on CPDs' impact on teaching quality was then assessed by the authors.

The methods and research findings of each study are now discussed in this part. Subsequently, the author collaborated with fellow authors to develop themes that derived upon specific elements specific to the research context. A log was maintained during the data analysis process to document analyses, recommendations, difficulties, and any other thoughts pertinent to the data interpretation. To look for differences in the topic development process, the authors cross-referenced the results of the previous phase. It is important to emphasize that the authors had internal discussions to settle any differences between ideas. To ensure cohesiveness, the developed themes were improved. Two experts on CPD and teaching management in schools participated in the analysis to verify its accuracy.
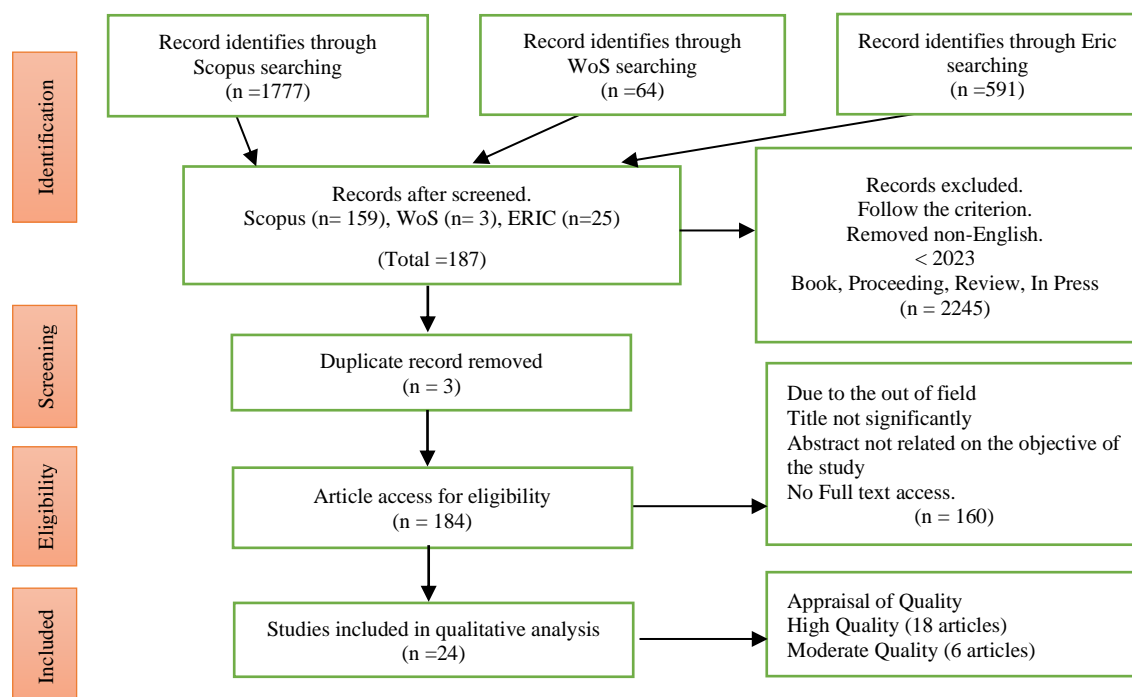

Figure 1. Flow diagram of the proposed searching study [30]

3.   RESULTS AND DISCUSSION

The review resulted in the identification of five main themes related to the impact of CPD on teaching quality. The five main themes were "student perceptions and teaching quality", "PD and teacher learning", "role of leadership in teacher development", "assessment and evaluation in teaching", and "collaboration and community in teaching". The results of each theme (1-5) are presented in Tables 3-7, respectively. The results provide a comprehensive analysis of the impact of CPD on teaching quality.

Table 3. The research article finding based on the proposed searching criteria of theme 1 (student perceptions and teaching quality)

No.	Authors	Title	Year
1	Carter *et al.*	'A good teacher should…': exploring student perceptions of teaching quality in Rwandan secondary education [31]	2023
2	Kellermann *et al.*	The effect of school leaders' feedback on teaching quality perceived by students–results of an intervention study [32]	2023
3	Olivos and Yuan	Teachers' beliefs about educational quality: examining the power of school settings through survey experiments [33]	2023
4	Jaekel *et al.*	Teaching characteristics in distance education—associations with teaching quality and students' learning experiences [34]	2023

Table 4. The research article finding based on the proposed searching criteria of theme 2 (PD and teacher learning)

No.	Authors	Title	Year
1	Abakah	Teacher learning from continuing professional development (CPD) participation: a sociocultural perspective [35]	2023
2	Adipat *et al.*	Technological pedagogical content knowledge for professional teacher development [36]	2023
3	Hernández-Ramos and Martínez-Abad	Professional development among secondary teachers in Spain: key associated factors as of PISA 2018 [37]	2023
4	Adams *et al.*	University teachers as versatile masters: evaluating the effectiveness of a professional development programme on student-centred teaching competencies [38]	2023
5	Revina *et al.*	Replacing the old with the new: long-term issues of teacher professional development reforms in Indonesia [39]	2023
6	Zhonger *et al.*	Current state and difficulties in Chinese MTI teachers' professional development [40]	2023

Table 5. The research article finding based on the proposed searching criteria of theme 3 (role of leadership in teacher development)

No.	Authors	Title	Year
1	Pham *et al.*	Internationalisation and English medium education in Vietnamese universities: professional role transformation among English language lecturers [41]	2023
2	Këndusi and Shatri	The role of the school principal in motivating teachers for professional development: case study of the municipality of Gjakova in Kosovo [42]	2023
3	Asmendri *et al.*	The roles of principals in teacher competency development for students' morale improvement [43]	2023
4	Liu and Watson	Whose leadership role is more substantial for teacher professional collaboration, job satisfaction and organizational commitment: a lens of distributed leadership [44]	2023

Table 6. The research article finding based on the proposed searching criteria of theme 4 (assessment and evaluation in teaching)

No.	Authors	Title	Year
1	Astambayeva *et al.*	Assessment of future primary school teachers' development of creative competence: a case study [45]	2023
2	Zhao *et al.*	Assessment of a training project of English as a media of instruction (EMI) using Kirkpatrick model [46]	2023
3	Hunter	Do you mean what I mean? Comparing teacher performance self-scores and evaluator-generated scores [47]	2023

Table 7. The research article finding based on the proposed searching criteria of theme 5 (collaboration and community in teaching)

No.	Authors	Title	Year
1	Agbenyega *et al.*	A study of Ghanaian inclusive basic school teachers' perspectives and uses of research evidence in pedagogical practice [48]	2023
2	Zabidi *et al.*	Exploring teacher collaboration: what's inside the Malaysian PLC black box? [49]	2023
3	Zheng and Luo	How do departmental professional learning communities and teacher leadership matter for teacher self-efficacy? A multi-level analysis [50]	2024
4	Dinh *et al.*	Professional learning communities in Vietnamese primary schools in the educational reform context: forms and challenges [51]	2023
5	Churchward and Willis	Early career teachers and the always becoming horizon of quality teaching [52]	2023
6	Moy *et al.*	Supporting PETE students to implement an alternative pedagogy [53]	2023
7	Rochnia *et al.*	Theory application in school and meaning-oriented learning opportunities at university—resources for teaching quality [54]	2023

3.1. General background of the selected studies

Regarding the topic of the selected research, three studies examined the impact of CPD on teaching quality of African teachers [31], [35], [48], three studies concentrated on China [40], [46], [50], three studies on German [32], [34], [54], two studies on Indonesia [39], [43], two studies on America [44], [47], two studies on Australia [52], [53], and a study on South America [33], Thailand [36], Spain [37], Belgium [38], Kosovo [42], Kazakhstan [45], and Malaysia [49]. Moreover, there were 13 quantitative research studies, nine qualitative research studies and two mixed methods (qualitative and quantitative) studies selected for the review.

3.2. Discussion

3.2.1. Student perceptions and teaching quality

It is becoming more and more clear that students' opinions on the quality of instruction are complex and varied. They highly value the hands-on approach and dedication of teachers, emphasizing the importance of positive teacher-student relationships and holistic learning experiences that impact them emotionally and cognitively [31]. Based on preliminary findings from an intervention study, students' perceptions of the quality of teaching can be significantly improved through focused improvements in teaching techniques, especially when it comes to teaching criteria [32]. It is interesting to note that teachers emphasize the need of preparation and interdisciplinary team support in creating high-quality relationships, but they also stress the importance of decision-making freedom and job satisfaction in improving the standard of their instructional strategies [33]. Furthermore, the ability of teachers to interact with students, preserve a favorable rapport, and invest in their education is continuously linked to the quality of teaching [34].

3.2.2. Professional development and teacher learning

The second theme in these findings, offers a broader viewpoint on how teachers interact with and gain from different kinds of PD. Teachers learn through formal instruction, unstructured self-directed learning, and non-formal CPD activities like workshops. Social relationship, agency, and critical reflection are important mediators of this learning process [35]. The cross-curricular improvement of teacher and student competencies is demonstrated by the integration of technological pedagogical content knowledge (TPACK) across disciplines, including science, English, social studies, and mathematics [36]. Evidence indicates that comprehensive PD is linked to enhanced school climates, creativity, teamwork, and leadership within educational communities, even if teachers' degrees of commitment to PD vary [37]. Following study visits, teachers expressed greater assurance in their diverse responsibilities and plans to adapt. Teachers expressed greater confidence in their diverse roles and intentions to change their conduct following study visits, emphasizing the transformative power of PD [38]. Nevertheless, problems still exist. For example, in Indonesia, teachers are unhappy because, even though the positive components of teacher professional development (TPD) have been incorporated, unresolved difficulties from the less ideal reform aspects have persisted [39]. Findings from the master of translation and interpretation (MTI) teaching context also show that professional advancement and joy with PD are not entirely consistent, suggesting opportunities for improvement in terms of effectively meeting teachers' needs and promoting their development [40]. This subject emphasizes the intricacy of teacher development and the vital role PD plays in promoting academic achievement. It also highlights the necessity of carefully planning and ongoing assessment of PD initiatives.

3.2.3. Role of leadership in teacher development

The third theme, "role of leadership in teacher development," summarizes the vital impact that leadership approaches and viewpoints have on the development and efficacy of teachers as professionals. The results show a complicated picture in which the drive for internationalizing higher education and the misconception that English as a media of instruction (EMI) is sufficient for academic success in English language development led to a reassessment of how best to use the skills of English language teaching (ELT) lecturers through shifts in institutional perspective [41]. In addition, the importance of PD is emphasized, emphasizing the need for teachers to quickly accomplish personal and professional growth, adjust to systemic changes, and negotiate the changing needs of education [42]. Nonetheless, it seems that leaders of schools play little part in raising student morale and teacher competency, indicating a lack of leadership support for teacher development [43]. On the other hand, the benefits of group decision-making for teacher performance highlight the importance of distributed leadership [44]. This strategy, which promotes positive attitudes towards teacher development and collaborative efforts between teachers and the management team, shares leadership responsibilities. Collectively, these results point to the importance of good leadership in maximizing teachers' potential for raising student achievement and educational quality. This includes both institutional strategies and hands-on management of schools.

3.2.4. Assessment and evaluation in teaching

The fourth theme, "assessment and evaluation in teaching," clarifies the vital components of promoting teacher competency, encouraging creativity, and strengthening the alignment of performance evaluation standards in learning environments. All the research point to a perceived lack of creativity in higher education, which emphasizes the need for novel strategies to develop students' creative competencies. Promising results in terms of participants enhanced creative potential were obtained from an experimental approach that offered additional training; this suggests a direction for future research, policy reform, and methodological advancements in the assessment of creative skills, especially among Kazakhstani primary school teachers [45]. Additionally, the Kirkpatrick assessment model confirmed the impact of EMI training on instructors' competence and confidence, suggesting possible advantages for the caliber of instruction provided to MBBS students [46]. Finally, the results point to ways that collaborative activities, such watching videos of classes and having pre-observation conversations, can improve the alignment between teachers and evaluators on performance criteria [47]. By working together, we hope to improve mutual knowledge of evaluation criteria and increase the fairness and accuracy of teacher assessments. To improve teaching quality and educational outcomes, these findings highlight the significance of creative assessment methodologies, focused PD, and transparent communication in evaluation processes.

3.2.5. Collaboration and community in teaching

The fifth theme, "collaboration and community in teaching," captures the spirit of collaboration and the effects of community involvement and collaborative practices on student learning outcomes and PD. The studies show a complex picture of the situation in which accessibility problems and a lack of resources restrict the use of research-based instruction (RBI). This emphasizes the requirement of organizational support and awareness to improve the implementation of evidence-based practices [48]. A culture of disciplined teacher collaboration, reflective discourse, and collective responsibility is fostered via professional learning communities (PLCs), which are essential for improving student learning outcomes and PD. The significance of reflective practices and shared accountability in augmenting teaching efficacy is highlighted by the significant link seen between PLC qualities and teacher self-efficacy [49].

Moreover, the distinction made between professional groups and core teacher groups within PLCs, as well as the identification of obstacles like structural limitations, conventional PD practices, and financial constraints, highlight the difficulties in putting into practice successful collaborative models [50], [51]. The use of relational and reflective practices by early career teachers (ECTs) highlights the significance of community and relational priorities in PD, pointing to a move towards a more practice-based approach to teaching quality [52]. Students enrolled in physical education teacher education (PETE) are interacting with collaborative PD models, which emphasizes how successful these techniques are in applying theoretical concepts to improve instruction quality and deepening pedagogical expertise [53].

Considered into a team, these results support the deliberate creation of cooperative learning spaces and community-focused teaching methods in the classroom. By removing obstacles to cooperation and creating atmospheres that value introspective discussion, group accountability, and research-based methods, teachers can improve their professional capacities and, eventually, the educational experiences of their students [54]. This subject emphasizes how community and collaboration have the power to redefine educational goals and methods of instruction.

4. CONCLUSION

A thorough landscape of factors influencing educational quality and teacher effectiveness is revealed by the systematic literature review across five distinct themes: "student perceptions and teaching quality", "PD and teacher learning", "role of leadership in teacher development", "assessment and evaluation in teaching", and "collaboration and community in teaching". The results emphasize the complex nature of students' perceptions of teaching quality, stressing the significance of connections between teachers and students, holistic learning, and focused PD initiatives. To improve educational outcomes, institutional changes and cooperative decision-making are necessary, and leadership emerges as a critical component in supporting teacher development. Methods for assessment and evaluation are essential for improving instruction, especially those that encourage teacher inventiveness and self-assurance. Ultimately, the improvement of student learning and support for teacher development depend heavily on the role of community and cooperation, particularly through PLCs and reflective practices. In conclusion, these themes promote a comprehensive strategy for educational reform, highlighting the necessity of creative assessment methods, leadership assistance, strategic PD, and cooperative community involvement to meet the changing needs of 21st-century teaching and learning.

The study's limitations include its reliance on literature reviews, potential publication bias, and the complexity of educational environments. The findings may not be universally applicable to all contexts,

especially those with significant cultural, economic, or policy differences. The study also may not fully capture the rapidly evolving digital and media landscapes influencing 21st-century teaching and learning. Future research should explore the interplay between teacher effectiveness and student perceptions of teaching quality, explore the psychological and pedagogical aspects of teacher-student relationships, and empirically evaluate the impact of PD models on teacher learning and effectiveness. Longitudinal studies should be conducted to observe leadership's influence on teacher development and educational outcomes. Innovative assessment methods and case studies should be explored to understand collaboration and community involvement in teaching.

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