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A review of the empirical research literature on PLCs for teachers in the Global South: evidence, implications, and directions

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ABSTRACT

This article presents a review of 70 empirical articles focussing on professional learning communities (PLCs) for teachers in the Global South. The review highlights an upward trend in the quantity of the publications on PLCs from 2010 onwards. The evidence suggests that PLCs could be initiated as a result of a mandate, a project of professional development, or needs for mutual support of teachers. This latest review identified evidence on some potential impacts of teachers' authentic participation in PLCs on their collaborative professional learning, efficacy, innovative teaching, and interpersonal trust building. The conditions for developing and sustaining PLCs include strong leadership support, readiness of infrastructure, focus on learning and teaching, and quality of trusting relationships. The article concludes with some recommendations to diversify and strengthen the evidence base of PLCs and to move forward with this significant model of professional development in the Global South.

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professional development;
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1. Introduction

Professional learning communities (PLCs) are a crucial model of teacher professional development that aims for enhanced learning and teaching in schools (Sims *et al.* 2021). The seminal review article of Stoll *et al.* (2006) defines PLC as 'a group of people sharing and critically interrogating their practice in an ongoing, reflective, collaborative, inclusive, learning-oriented, growth-promoting way; operating as a collective enterprise' (Stoll *et al.* 2006, p. 223). While PLCs could be defined in various ways, we used this comprehensive definition of Stoll *et al.* (2006) to guide our review process. This definition underscores professional collaboration, sustained learning, and reflection as hallmarks associated with PLCs.

Formal research on PLCs emerged in the 1980s (Stoll *et al.* 2006). Two key reviews (Stoll *et al.* 2006, Vescio *et al.* 2008) were conducted to synthesise the body of literature on PLCs from the 1980s to the early 2000s. Stoll *et al.* (2006) explored the meaning, characteristics, possible impact of and factors influencing creation and development of PLCs. Vescio *et al.* (2008) reviewed 11 research articles and focused their synthesis on exploring the impact of PLCs on teaching and learning. Stoll *et al.* (2006) conceptualised PLCs as fluid entities that promote characteristics of shared values and vision, collective responsibility, reflective professional inquiry, and supporting collaborative learning. To support creation and implementation of PLCs, this review stated the importance of various factors and processes, including focus on learning processes, optimising human and social

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resources, and managing structural resources effectively (Stoll *et al.* 2006). Both these reviews (Stoll *et al.* 2006, Vescio *et al.* 2008) highlighted the potential impact of PLCs on teacher capacity building and the quality of teaching and student learning. In short, these two reviews jointly provided initial insights into the characteristics, implementation, and impact of PLCs. Nevertheless, these insights were mostly drawn from the research in the United States and some other countries or nations in the Western world (e.g. England).

As a continuity of Stoll *et al.* (2006) and Vescio *et al.* (2008), a limited number of reviews relevant to PLCs have been published recently (e.g. Dogan *et al.* 2016, Qiao *et al.* 2018). However, these reviews limited their focus on a single country, for example, China (Qiao *et al.* 2018). The geographical locus of Dogan *et al.* (2016) was on more than one country; however, they narrowed their review on 14 articles only to investigate the impact of PLCs on science teachers' knowledge and practice. Their review considered 12 articles based on studies in the United States, one article from the United Kingdom, and one article from Bangladesh (also included in the current review).

There are no major reviews focusing on PLCs in the Global South found in the literature till the present. Aligning with the conceptual paper of Dados and Connell (2012), the current review defines this contested concept of Global South as a group of low- and middle-income countries in the regions of Latin America, Asia, Africa, and Oceania. Internationally, there is a growing interest in supporting development in the Global South through conducting and mobilising educational research in this area. The United Nations Sustainable Development Goals (SDGs) were created as a blueprint to provide all countries across the world to prosper. SDG4 specifically focuses on 'quality education' and aims to 'ensure inclusive and equitable education and promote lifelong learning opportunities for all'. Indicator SDG4.c reflects on the need for teaching quality. Working towards the achievement of SDG4 (Sustainable Development Goal 4) is an important pathway to supporting development and social equity of low- and middle-income countries. Effective professional development for teachers plays a critical role in improving quality education, given its positive effects on learning and teaching (Sims *et al.* 2021).

We were commissioned by a non-profit organisation to undertake an independent review to explore and identify gaps in the evidence base of PLCs in the Global South. This review also aimed to synthesise evidence to inform the development of PLCs as a model of teacher professional development for schools in the Global South. The design of the following research questions was guided by our reading of the core, referent reviews of Stoll *et al.* (2006) and Vescio *et al.* (2008). As will be discussed below, the vast majority of research articles on PLCs in the Global South have been published since 2006, after their reviews.

The current article outlines emerging evidence from this review of the empirical research on PLCs in the Global South to discuss the following research questions (RQ).

RQ1. How and by whom are PLCs for teachers initiated?

RQ2. What is the impact of PLCs on teacher professional development for teachers?

RQ3. What are the conditions for supporting PLCs for teachers?

The subsequent part of this article presents the review process of searching for and synthesising evidence from empirical articles on PLCs in the Global South.

2. Review process

The current review analyses 70 published journal articles concerning PLCs in the period from January 2000 to May 2021. We formulated seven inclusion criteria to guide the selection of publications, as elaborated in Table 1. The review process involved five iterative stages, as informed

Table 1. Inclusion Criteria for the current Review.

Inclusion criteria	Elaboration of criteria
1. Time frame	This review shortlisted articles published between January 2000 and May 2021. Most articles included in the two previous referent reviews (i.e. Stoll <i>et al.</i> 2006, Vescio <i>et al.</i> 2008) were published before 2000. We therefore chose 2000 as a starting point to systematically cover the empirical research on PLCs in the Global South for the past two decades. May 2021 was a cut-off time for this current review.
2. Language	This review focused on articles in English. We discuss the implication for this inclusion criterion in the section of Discussion and Conclusions of the current article.
3. Geographical locus	This review centred on articles drawn from research undertaken in countries in the Global South. The list of these countries was taken from the OECD website (see https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC-List-ODA-Recipients-for-reporting-2021-flows.pdf).
4. Type of research	This review focused on exploring the empirical evidence base on PLCs in the Global south. This exploration aimed to provide a better understanding, grounded in empirical investigations, of the initiation and impact of and conditions for PLCs. We therefore considered empirical articles only. An empirical article draws on empirical data and provides a description of methods of data collection and analysis.
5. Type of publications	This review shortlisted peer-reviewed journal articles, indexed in Scopus. The choice of Scopus is elaborated in Step 1 of our review process.
6. Content	An article is included if it centrally discusses the nature, processes, practices, and impact of PLCs and factors influencing for PLCs. We adopted the definition (see above) of Stoll <i>et al.</i> (2006) to guide our shortlisting process of articles.
7. Research settings	This review focused on research undertaken in K-12 settings, as a continuity of these two key reviews (i.e. Stoll <i>et al.</i> 2006, Vescio <i>et al.</i> 2008) as mentioned earlier.

by PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Page *et al.* 2018) (see Figure 1). We started piloting search strategies in April 2021. The formal review process lasted from early May to October 2021.

Step 1. We considered the usefulness and practicality of major databases in social sciences that include education. The launch of integrated multidisciplinary databases of the Web of Science (1997), Google Scholar (2004), and Scopus (2004) has enabled the search of academic literature to be more systematic and reliable. These three databases have more advantages in terms of both coverage and systematic data extraction, as compared with a manual search for printed journals and subject-specific databases such as Eric and A⁺ Education. Given these advantages, many review studies in recent years have widely used these databases to search for and extract data (see Martín-Martín *et al.* 2018). The choice of which databases should be informed by the purpose and focus of their reviews and careful consideration of practicality.

Scopus is a comprehensive digital database that stores peer-reviewed documents in social sciences. According to Elsevier, Scopus is the ‘world’s largest abstract and indexing database’. Scopus has been used as a key database in the recent major reviews on educational research (e.g. Hallinger and Kulophas 2020) and similarly utilised in the current review. Our decision to utilise Scopus was informed and justified by (a) *the observations of Zupic and Čater (2015)* and (b) *the findings from the latest, major study of Martín-Martín et al. (2018) that compared the coverage of research outputs among three most comprehensive databases*. Martín-Martín *et al.* (2018) concluded:

- (i) the overlap of research outputs covered by Google Scholar, Scopus and the Web of Science is substantial;
- (ii) Google Scholar has more coverage than Scopus and the Web of Science; however, many of those sources uniquely indexed by the Google Scholar are not journal articles – the focus of our review is on peer-reviewed journal articles; and
- (iii) 11.7% of the research outputs covered by Scopus but not by the Web of Science while only 3.9% of the research outputs indexed by the Web of Science but not by Scopus.

This (iii) finding, alongside the observation of Hallinger and Kulophas (2020), suggests that Scopus has a more comprehensive coverage of peer-reviewed documents in social sciences (including education) than the Web of Science. In addition, (iv) Scopus offers more complete bibliographic

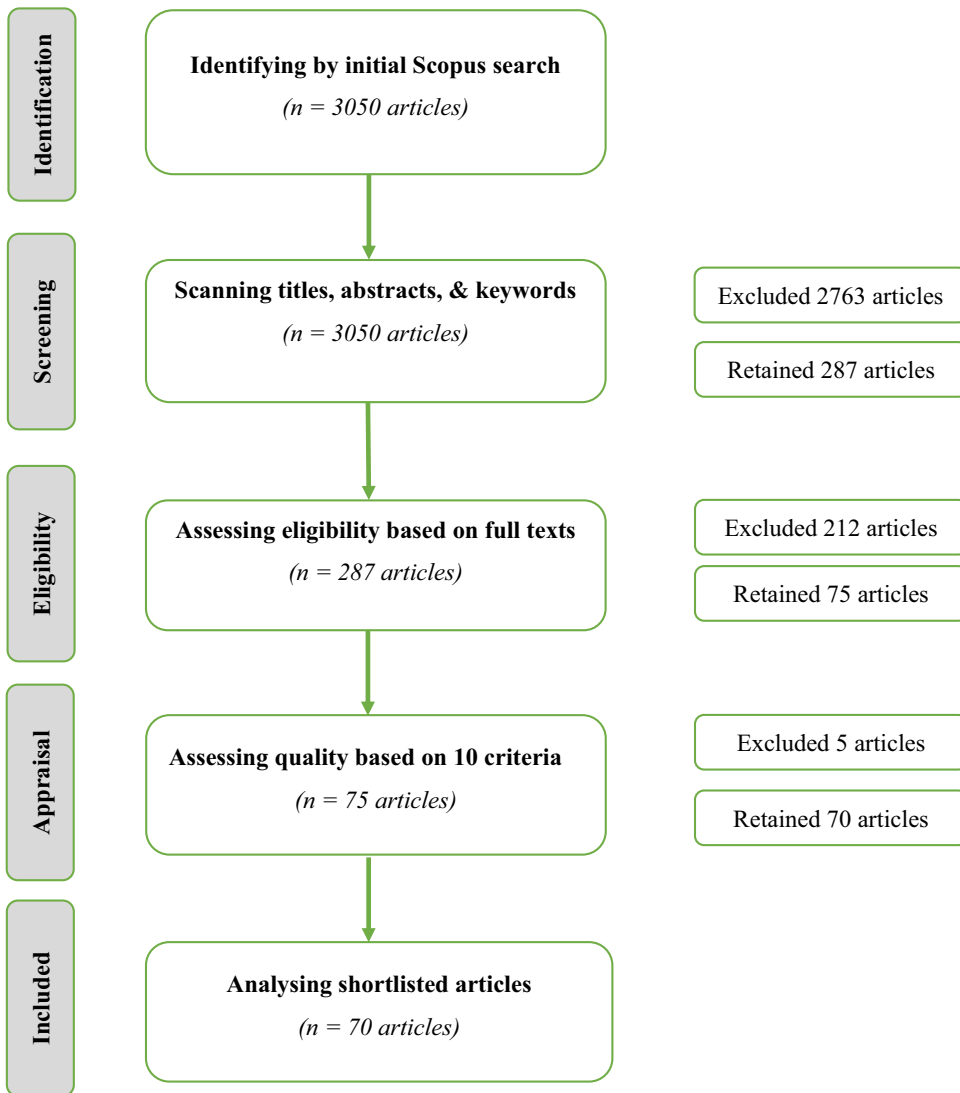


Figure 1. PRISMA flow diagram of steps in the identification and screening of sources (Page *et al.* 2018).

data and sophisticated engines to search for and extract data than Google Scholar (Zupic and Čater 2015).

Taken all these points (i), (ii), (iii), and (iv) together, Scopus was considered the most satisfactory choice, considering the purpose of this review of refereed journal articles and practical suitability and reliability in systematically searching for and storing documents.

We entered a set of keywords in the search engine of Scopus. Our inclusion of these keywords was informed by our reading of previous reviews on PLCs (Stoll *et al.* 2006, Vescio *et al.* 2008) and a pilot of scanning 10 empirical articles on PLCs. This set of keywords included: 'professional learning community' OR 'learning community' OR 'teacher learning' OR 'professional community' OR 'teacher community' OR 'professional learning' OR 'professional development' OR 'professional network' OR 'community of practice' OR 'staff development'. We simultaneously keyed in a list of countries in the Global South, as shown in [Appendix 1](#).

We set a default function in the search engine of Scopus so that a publication, any part (title, abstract, or list of keywords) of which any of the aforementioned keywords was shortlisted in the first round. In this stage, we delimited the search to peer-review journal articles, English language, and time frame from January 2000 to May 2021, as elaborated in [Table 1](#).

Step 2. We scanned the titles, abstracts, and keywords of all 3050 results for immediate relevance. All publications that seemed to be relevant to PLCs were saved for further scrutiny in the subsequent step. This practice shortlisted 287 potential articles.

Step 3. We read the titles, abstracts, keywords, and full texts of these 287 articles. We focused our reading to examine if these 287 articles fulfilled all Criterion 3, Criterion 4, Criterion 6, and Criterion 7 (see [Table 1](#)).

- We excluded 173 articles because these are not centrally relevant to PLCs in schools. These articles (e.g. Zhang *et al.* 2021) mention the words or phrases such as professional learning, professional development, or PLCs in the abstract or list of keywords, but the main content does not address PLCs as the main topic or narrative of the article.
- We excluded 26 articles (e.g. Mintz *et al.* 2021) because they are not clearly based on empirical research undertaken in at least one country/nation in the Global South.
- We were not able to obtain full texts of 6 articles.
- We excluded 1 article because it is overly repetitive of another article (of the same team of researchers) that had already been shortlisted for review in this stage.
- We excluded 6 articles because they are clearly non-empirical, to align with the Inclusion Criterion 4 in [Table 1](#).

As a result, we shortlisted 75 articles for review upon this step.

Step 4. We developed a 10-criteria framework for appraisal to evaluate these 75 articles retained in Step 3 for the purpose of quality filtering of this review. The framework incorporates the key elements of conceptualisation, methods, and interpretation of the findings of an academic article (Cohen *et al.* 2018). These criteria are specified in [Appendix 2](#). The results from this appraisal exercise are presented as follows.

- 46 articles were ranked in the category of ‘high quality’.
- 24 articles were ranked in the category of ‘medium quality’.
- 5 articles were ranked in the category of ‘low quality’.

We excluded all articles in the ‘low quality’ category to enhance the trustworthiness of the evidence base of PLCs in the Global South.

Step 5. We developed an MS Excel spreadsheet to collect the details of each of these 70 articles. [Appendix 3](#) shows an example of articles analysed in the abbreviated form of the spreadsheet. We used descriptive statistics and graphing of trends (Zupic and Čater 2015) to identify the bibliometric patterns of publication generation, research contexts, and research approaches. We employed a meta-aggregative method (Joanna Briggs Institute 2020, Pursell and Gould 2021) to synthesise findings across the reviewed articles. This synthesis was guided by our research questions mentioned above. The use of the method of meta-aggregation involved three steps:

- (1) extracting findings from the publications,
- (2) combining these findings into categories, and
- (3) organising categorised findings into thematic statements.

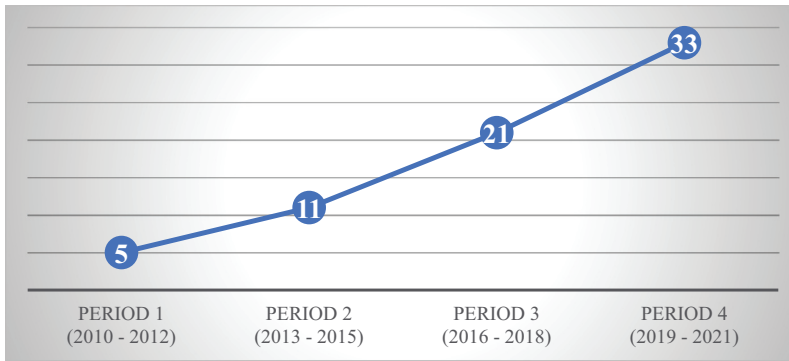


Figure 2. The number of articles across review periods.

Informed by Pursell and Gould (2021), we constructed each major thematic statement based on at least two articles listed in the category of ‘high quality’. These thematic statements are presented in the subsequent sections of this article to respond to the research questions.

3. Overview of the evidence base

The evidence base drawn from these 70 reviewed articles has some noteworthy characteristics. *Firstly*, there has been a prominent increase in the volume of publications on PLCs in the Global South in the past five years (2016–2021). *Secondly*, this evidence base has been mainly drawn from empirical research in China (approx. 33% of publications), South Africa (21% of publications), and Malaysia (17% of publications). *Thirdly*, the evidence is constructed from empirical investigations using a range of approaches of qualitative, quantitative, and mixed-methods research. These characteristics are detailed in the subsequent parts of this article.

3.1. Generation of evidence on PLCs in the Global South

As noted in the review process, we searched for publications generated between January 2000 and May 2021. The first two steps of the review process shortlisted 287 potential articles, published from January 2002 to May 2021. Twelve of these 287 publications were made between 2002 and 2009. Upon further rounds of screening, assessing eligibility and appraising publications in the three remaining steps, the 70 articles included in the finalised list were issued between 2010 and 2021. We divided this time (2010–2021) equally into four periods to observe any possible trends in the generation of evidence regarding PLCs in the Global South. As shown in Figure 2, there is a visible upward trend in the number of articles over years. This trend indicates a growing scholarly interest in uncovering PLCs in the Global South.

3.2. Geographical distribution of the PLCs literature in the Global South

The heat map in Figure 3 displays the distribution of the empirical research on PLCs in the Global South from 2010 to 2021. The review found 70 scholarly contributions from 12 countries across continents. 70% of the articles (49 out of 70 articles) were authored in the Asian region. The remaining articles are based on the studies in Africa (16 articles) and Latin America and Caribbean (5 articles). Considering the contributions by country, China (23 articles) hosted the most articles in this list, followed by South Africa (15 articles) and Malaysia (12 articles).

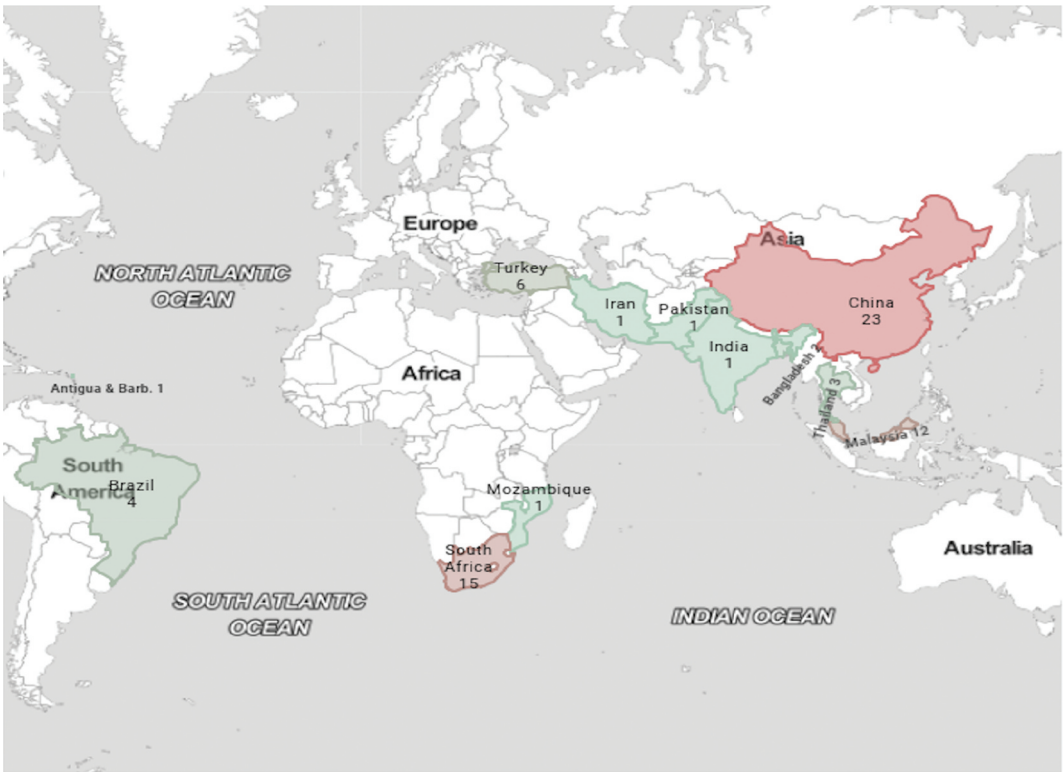


Figure 3. The number of articles by country.

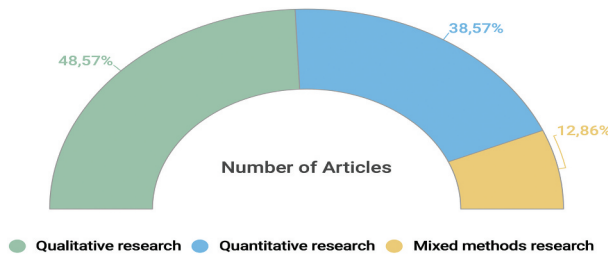


Figure 4. The number of articles by research approach..

3.3. Methodological patterns of research on PLCs in the Global South

Turning next to the research approaches used in the reviewed studies of PLCs, all empirical articles were categorically grouped into quantitative, qualitative, or mixed-methods research approaches (see Figure 4). There is a relative balance in the use of quantitative and qualitative methods. Of 70 articles, 27 adopted a quantitative research approach while 34 articles used a qualitative research approach, and nine articles drew on mixed methods research.

4. Evidence on initiation, impact, and conditions for PLCs

4.1. Initiation of PLCs

This sub-section discusses the evidence to respond to the first research question: *How and by whom are PLCs initiated?* A few articles discuss, of varying depth, the context of PLCs in their research (e.g. Murugaiah *et al.* 2013, Brodie 2014, Gonçalves *et al.* 2020, Zhang and Yuan 2020, Zheng *et al.* 2021). An analysis of these articles highlights some approaches to initiate PLCs in the Global South. These complementary approaches can be categorised as *a contrived approach*, *a project-based approach*, and *a teacher-initiated approach*. Yet, these articles offer no clear evidence to make any comparison about the effectiveness of these approaches. The following part elaborates on each of these approaches.

4.1.1. A contrived approach

A contrived approach refers to initiation of a PLC as mandate for schools. Research (e.g., Zhang and Yuan 2020, Zhang *et al.* 2017, Zheng *et al.* 2021) in mainland China has clarified that a PLC in Chinese schools tends to be known as a Teaching Research Group (TRG). A TRG is typically organised intentionally for teachers of the same subject or grade in a school. The model of TRG is similar to that of Lesson Preparation Group and Grade Group. It was initiated by the Ministry of Education, China in the 1950s with the aim of promoting collaborative professional learning for teachers (Wang *et al.* 2017). Schools in China are directed to organise TRGs as a platform for teachers to engage regularly in professional activities such as peer classroom observation, collaborative lesson planning, and collaborative action research (Zhang and Yuan 2020).

4.1.2. A project-based approach

A project-based approach involves initiating a PLC as part of a professional development project (Murugaiah *et al.* 2013, Zhang and Liu 2019) or an action research project (Brodie 2014, Gonçalves *et al.* 2020). For example, Zhang and Liu (2019) investigated online PLCs launched as part of a five-year teacher development programme coordinated by the Ministry of Education, China. This programme required all participants to spend 120 h to participate in virtual PLCs and to complete three online tasks, namely watching video cases, engaging in discussion, and sharing reflections. Online PLCs described in Murugaiah *et al.* (2013) provide another example of a project-based approach. As a result of a school–university partnership in Malaysia, these online PLCs were established to provide teachers with a space for collaborative learning to optimise technologies in their classes (Murugaiah *et al.* 2013). Brodie's (2014) article was drawn from an action research project that involved establishing a small-size PLC of three to four teachers and a group leader. This PLC focused on discussing strategies to work with students' common errors associated with mathematical concepts.

4.1.3. A teacher-initiated approach

A teacher-initiated approach forms PLC as a result of the needs of small groups of teachers for mutual support at work (Vandeyar 2013, Gonçalves *et al.* 2020). Vandeyar (2013) provided an instance of teachers establishing PLCs in South African schools to support each other in implementing a national policy of using Information Communications Technology (ICT) in classroom teaching. These teachers faced challenges in the use of ICT as a result of insufficient guidance and district support in enacting this policy (Vandeyar 2013). Similarly, a group of teachers of physical education in Gonçalves *et al.* (2020) initiated a PLC with the support of an external facilitator to support each other with subject knowledge and professional opportunities.

4.2. Impact of PLCs

The current sub-section responds to the second research question: *What is the impact of PLCs on professional development for teachers?* The reviewed articles provide evidence on the positive impact of PLCs on supporting teachers' collaborative learning, development of teaching efficacy, innovative changes, and trusting relationships in schools, as presented in the following four key themes.

4.2.1. PLCs support teacher collaborative learning

At least eight articles (e.g. Kempen and Steyn 2017, Gonçalves *et al.* 2021) have suggested PLCs as an effective platform for teacher professional learning. These articles, mostly drawn from qualitative research, have highlighted the significance of PLCs in promoting collaborative learning among teachers. This collaborative learning is promoted through teachers' sustained discussions of their pedagogical practices, subject-specific matters, and classroom management, and their sharing of instructional materials and resources (Rolando *et al.* 2014). These discussions would benefit teachers' professional development (Kempen and Steyn 2017, Mu *et al.* 2018).

4.2.2. Participation in PLCs supports teachers' development of teaching efficacy

At least three articles (Zonoubi *et al.* 2017, Liang *et al.* 2020) evidence the link between teachers' participation in PLCs and their increased teaching efficacy. These studies suggested that teachers' professional interactions in PLCs would enhance their efficacy of developing and delivering innovative teaching practices (e.g. Zonoubi *et al.* 2017, Liang *et al.* 2020) and using strategies of classroom management (Zonoubi *et al.* 2017, Liang *et al.* 2020) and student engagement (Liang *et al.* 2020). In addition, Liang *et al.* (2020) suggested teachers' participation in PLCs would promote their well-being, through improving their self-efficacy, though this finding would require empirical verification in future research.

4.2.3. Participation in PLCs supports teachers' innovative changes in teaching

A group of six articles (e.g. El-Hani and Greca 2013, Vandeyar 2013, Brodie 2014) provide some evidence on the influence of teachers' participation in PLCs on their process of innovating their teaching practices. Teachers' involvement in authentic discussions in PLCs could enhance their knowledge about the student learning needs, their desire to innovate their teaching to support student learning more effectively, and their receptivity to innovative ideas (e.g. Song 2012, Brodie 2014). PLCs could also be a platform to support discussions on interpretation and implementation of new educational policies (El-Hani and Greca 2013).

4.2.4. PLCs support teachers in building trusting relationships

The review found evidence suggesting that PLC functions on the basis of trusting relationships and this trust could be enhanced through effective collaboration among its members (e.g. Kempen and Steyn 2017, Akinyemi *et al.* 2020). Effective collaborative working in PLCs would give teachers a sense of 'togetherness' and 'closeness' and help them to build trust with colleagues (Kempen and Steyn 2017). This accumulated trust from the collaboration in PLCs would further inspire teachers to support one another with learning and teaching (Akinyemi *et al.* 2020).

4.3. Conditions for PLCs

The reviewed articles provide evidence-based insights into important conditions for development, implementation, and sustainability of PLCs. This sub-section presents these insights to address the third research question: *What are the conditions for supporting PLCs for teachers?* These conditions can be thematically presented as: (4.3.1) *leadership support*, (4.3.2) *readiness of infrastructure*, (4.3.3) *focus on learning and teaching*, and (4.3.4) *quality of trusting relationships*.

Table 2. Synthesis of research evidence on supportive leadership practices for PLCs.

Supportive leadership practices for PLCs	Evidenced in
Creating PLC meeting time for teachers (within their office hours)	Zahedi <i>et al.</i> (2021)
Ensuring an appropriate meeting space and technology to support discussions for PLCs	Zahedi <i>et al.</i> (2021)
Attending PLCs meetings in a collaborative role	Somprach <i>et al.</i> (2017) Zahedi <i>et al.</i> (2021)
Emphasising the importance of PLCs through communications	Zahedi <i>et al.</i> (2021)
Exercising ethical leadership through treating teachers with integrity, sincerity and respect and promoting an ethical climate in PLCs	Liu and Yin (2020), Luyten and Bazo (2019), Somprach <i>et al.</i> (2017)
Creating structures to engage teachers in participative decision making in PLCs	Luyten and Bazo (2019), Zahedi <i>et al.</i> (2021)
Encouraging teachers' experimentation and innovation in teaching	Zhang and Sun (2018)

4.3.1. Support of leadership

At least 10 reviewed articles provide a range of evidence that highlights the significance of leadership support in developing, implementing, and sustaining PLCs in the Global South (e.g. Luyten and Bazo 2019, Liu and Yin 2020). The evidence recommends ethical, instructional, and transformational leadership as supportive models and practices for PLCs in schools. More specifically, the positive practices associated with transformational leadership and instructional leadership are evidenced to support PLCs (e.g. Somprach *et al.* 2017, Luyten and Bazo 2019). These practices are exemplified in Table 2.

4.3.2. Readiness of infrastructure: time, space, communication, and technological and financial support

A group of nine articles (e.g. Younger and George 2013, Chua *et al.* 2020, Tahir and Musah 2020) have underscored the importance of infrastructure-related factors in establishing and sustaining PLCs. The broad term of 'infrastructure' refers to a variety of factors such as time structure (e.g. Chua *et al.* 2020), communication mechanism (e.g. Zhang and Yuan 2020), financial resources (e.g. Tahir and Musah 2020), and space for collaborative professional learning (e.g. Younger and George 2013).

Firstly, an appropriate time structure has been mentioned as one of the critical conditions for implementing and sustaining PLCs (e.g. Younger and George 2013, Tahir and Musah 2020). Empirical research in Antigua and Barbuda (Younger and George 2013), China (e.g. Zhang *et al.* 2021), Malaysia (Khalid *et al.* 2014), and South Africa (Akinyemi *et al.* 2019) has consistently highlighted the lack of time as a barrier to authentic collaborative learning in either face to face or virtual PLCs. The time issue is closely connected with a sense of overwhelming workload that requires teachers to handle daily administrative tasks in addition to teaching and assessment (Akinyemi *et al.* 2019, Chua *et al.* 2020). The evidence from this research suggests a need to structure time, within teachers' workload for collaborative activities in PLCs and protect this time.

Secondly, collaborative learning in PLCs requires sustained professional interactions, both formally and informally. Establishing and maintaining a sound mechanism to support communications within and across PLCs is critical in routinising collaborative learning among PLC members (Zhang and Sun 2018).

Thirdly, financial support is documented as a condition for implementation of PLCs (Tahir and Musah 2020, Zhang *et al.* 2021). These studies highlighted the challenges of sustaining PLCs in the schools where there are weak or little financial resources. The financial constraint is a barrier to supporting schools with essential technologies and human resources for enacting initiatives for collaborative learning in PLCs (Tahir and Musah 2020, Zhang *et al.* 2021).

Fourthly, the review highlights a need for supportive space for authentic teacher collaborative learning (Younger and George 2013, Zhang and Yuan 2020). This space could be physical (e.g. Wang *et al.* 2017, Zhang and Wong 2018) or virtual (e.g. El-Hani and Greca 2013, Lin *et al.* 2016). Ideally, this space should be designed to inspire and to give the members of PLCs a sense of

psychological safety to share and leverage collective efforts to address their professional challenges (Younger and George 2013).

4.3.3. Focus on learning and teaching

The evidence suggests that the focus of PLCs should be on learning and teaching, rather than on addressing administrative issues (Zhang and Liu 2019, Zahedi *et al.* 2021). This focus should shape the vision, goals and agenda of PLCs and be explicitly communicated with the members. Zahedi *et al.* (2021) investigated implementation of PLCs in two schools in India. Each PLC had between five and nine teachers and one facilitator. A specific protocol and agenda were developed for each meeting. This mixed-methods study of Zahedi *et al.* (2021) identified three important characteristics of an effective PLC, namely meetings focused on learning and teaching matters, data-driven discussions and decisions, and supportive leadership. Zhang and Liu (2019) investigated the factors influencing teacher learning engagement in online PLCs. They surveyed 520 teachers of primary and secondary schools that participated in a training programme initiated by the Chinese Ministry of Education. Involvement in these online PLCs required each teacher to watch video cases, engage in online discussions, and write up reflections. The statistical results from this study indicated that teachers tended to engage (more) in these PLCs' activities if they believed these activities were relevant to learning and teaching.

4.3.4. Quality of collaborative relationships

The review suggests that teachers' participation in PLCs is dependent on the quality of collaborative relationships among PLC members. Healthy professional relationships with peers would promote teachers' engagement in collaborative discussions, activities, and decision making in PLCs (e.g. Zhang and Sun 2018, Woolway *et al.* 2019). Woolway *et al.* (2019) analysed the professional development of four teachers participating in a PLC from data collected at different points over two years. Woolway *et al.* (2019) observed the development in the efficacy of inexperienced teachers in initiation and participation in reflective discussions. Based on its evidence, this study argued that collaborative relationships between teachers were instrumental in building their efficacy of leading professional learning and in sustaining this small PLC (Woolway *et al.* 2019).

Akinyemi *et al.* (2020) affirmed that the positive professional relationships enabled PLC members to support one another in discussing and managing challenges. This finding was based on an analysis of interview and survey data from 79 participants from 10 high schools in South Africa. Similarly, two quantitative research studies in China (Zhang and Sun 2018) and Turkey (Bellibas *et al.* 2017) suggested that PLC members' strong collaborative relationships would promote fruitful discussions on learning, teaching, and assessment matters.

5. Discussion and conclusions

The current review has explored the evidence base on PLCs in the Global South. This section provides a summary of the review and discusses limitations and suggestions for future research to diversity and strengthen the evidence based on PLCs.

5.1 Summary of the current review in relation to the previous reviews

The current evidence base enhances an understanding of initiation, impact, and conditions for PLCs in the Global South contexts. It highlights that PLCs could be initiated at the group, school, or system levels. This sub-section summarises and discusses our review's key findings on the impact and conditions for PLCs in relation to those found in the other key reviews on PLCs (i.e. Stoll *et al.* 2006, Vescio *et al.* 2008).

Concerning the impact, *firstly*, this review suggests a range of evidence supporting the positive impact of teachers' authentic participation in PLCs on their collaborative professional learning. Our

review, based on a group of eight articles (e.g. Kempen and Steyn 2017, Gonçalves *et al.* 2021), evidences a potential, positive link between participation in PLCs and teacher professional learning. This pool of evidence substantiates the claim from the previous reviews (Stoll *et al.* 2006, Vescio *et al.* 2008) that PLCs promote teachers' individual and collaborative learning (Stoll *et al.* 2006) and teacher continuous learning (Vescio *et al.* 2008). *Secondly*, this review suggests that teachers are likely to gain a better sense of efficacy in implementing their professional practices as a result of sustained participation in PLCs. This suggestion corroborates the idea in Stoll *et al.* (2006), but further specifies professional practices as instructional methods, classroom management, and strategies for student engagement. *Thirdly*, the evidence (e.g. El-Hani and Greca 2013, Kempen and Steyn 2017) from our review supports the idea in the two previous reviews (Stoll *et al.* 2006, Vescio *et al.* 2008) that positive PLCs would contribute to building innovative climate and collaborative culture.

In summary, the findings from our review, in combination with the two previous reviews mostly based on research in Western countries (Stoll *et al.* 2006, Vescio *et al.* 2008), support a claim that participation in PLCs is likely to promote teacher learning, professional efficacy, innovative climate, and collaborative culture in schools across national contexts. This encouraging range of evidence suggests the significance of PLCs in developing teachers and stronger support for development and sustainability of PLCs in the Global South.

Our review, in alignment with Stoll *et al.* (2006), evidences multiple conditions required to develop and sustain PLCs. These include strong support of leadership at all levels, positive cultures of professional learning and collaboration, and supportive infrastructure of time, communication, and finance. However, the evidence (e.g. Younger and George 2013, Zhang *et al.* 2021) highlights that time and financial constraints are the major challenges to sustaining PLCs in schools in many countries in the Global South. This evidence recommends the need to develop a more effective time structure to incorporate PLCs activities within teachers' workload and to support schools in the Global South with more resources for PLCs.

5.2. Limitations to the review, implications, and suggestions for future research

The current review covers the research outputs indexed in the major Scopus database, as elaborated in the previous section. Like other international reviews (e.g. Nguyen *et al.* 2020, Hallinger and Kulophas 2020), this review considered articles written in English only and therefore potentially missed a hidden literature written in other languages. This limitation should be noted in consideration of the following implications and suggestions for future research.

The upward trend in the quantity of publications, as noted earlier, suggests an emerging evidence base on PLCs in the Global South. However, this uneven evidence base has been predominantly drawn from the empirical research in upper-middle-income countries (i.e. China, Malaysia, South Africa), as classified by OECD (2021). The current evidence base lacks empirical research contributions from many low-income countries (e.g. Angola, Cambodia) and unique national contexts (e.g. Bolivia, Botswana) in the Global South. This imbalance in the formal knowledge production highlights a need for more empirical investigations to diversify and strengthen the evidence base on PLCs in this area.

The current review suggests that teachers experience inherent tensions and challenges in participating in PLCs (e.g. Tahir and Musah 2020, Zhang *et al.* 2021). However, we found little evidence to enable a systematic understanding of the nature, reasons, and effects of these tensions and challenges. Hence, more research efforts to theorise these tensions and challenges of PLC members would be needed to provide the leadership and policy with systematic insights into supporting PLCs more effectively.

The current review has advanced an understanding of the potential impact of participation in PLCs on teachers and teaching. However, these claims on the impact require more robust, empirical substantiation for a more in-depth understanding (a). We found no studies that centrally focussed

on investigating the effects of PLCs on student learning (b). These (a) and (b) underscore a great need for a multiplicity of rigorous empirical studies using a range of complementary research designs and methods to strengthen evidence based on the pathways of the impact of PLCs on student learning and on how to harness their potentials.

Developmental evaluation is an important process in the models of professional development in education. The current review hardly found any evidence, articles or models centrally addressing the evaluation of the implementation of PLCs. This gap in the empirical literature in the Global South highlights the importance for the research community to work with schools and national systems to develop context-sensitive frameworks to evaluate the implementation of programmes within and across PLCs over time. This framework should be built on evidence and be designed to support effective implementation and sustainability of PLCs.

To support implementation of SDG4, the long-term agenda to strengthen and diversify the evidence base of PLCs in the Global South would benefit from collaborative efforts of the global scholarly communities, governments, and international organisations. These efforts should probably involve establishing international collaborations to conduct more robust, empirical investigations in under-researched contexts. It would be necessary to conduct and publish reviews of rigorous research outputs written up in other national languages. Finally, it would be helpful to conduct in-depth comparative analyses to enable nuanced understanding on PLCs across countries in the Global South and other areas globally.

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Appendices

Appendix 1. Screen print from Scopus search

3,050 document results

(TITLE-ABS-KEY ("professional learning community") OR TITLE-ABS-KEY ("learning community") OR TITLE-ABS-KEY ("teacher learning") OR TITLE-ABS-KEY ("professional community") OR TITLE-ABS-KEY ("teacher community") OR TITLE-ABS-KEY ("professional learning") OR TITLE-ABS-KEY ("professional development") OR TITLE-ABS-KEY ("professional network") OR TITLE-ABS-KEY ("community of practice") OR TITLE-ABS-KEY ("staff development") AND NOT TITLE-ABS-KEY (university) AND NOT TITLE-ABS-KEY ("higher education") AND NOT TITLE-ABS-KEY (pre-service)) AND PUBYEAR > 1999 AND PUBYEAR <= 2022 AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (AFFILCOUNTRY, "South Africa") OR LIMIT-TO (AFFILCOUNTRY, "Turkey") OR LIMIT-TO (AFFILCOUNTRY, "China") OR LIMIT-TO (AFFILCOUNTRY, "Malaysia") OR LIMIT-TO (AFFILCOUNTRY, "Brazil") OR LIMIT-TO (AFFILCOUNTRY, "India") OR LIMIT-TO (AFFILCOUNTRY, "Thailand") OR LIMIT-TO (AFFILCOUNTRY, "Pakistan") OR LIMIT-TO (AFFILCOUNTRY, "Iran") OR LIMIT-TO (AFFILCOUNTRY, "Kazakhstan") OR LIMIT-TO (AFFILCOUNTRY, "Ukraine") OR LIMIT-TO (AFFILCOUNTRY, "Serbia") OR LIMIT-TO (AFFILCOUNTRY, "Viet Nam") OR LIMIT-TO (AFFILCOUNTRY, "Colombia") OR LIMIT-TO (AFFILCOUNTRY, "Nigeria") OR LIMIT-TO (AFFILCOUNTRY, "Jordan") OR LIMIT-TO (AFFILCOUNTRY, "Ghana") OR LIMIT-TO (AFFILCOUNTRY, "Kenya") OR LIMIT-TO (AFFILCOUNTRY, "Tanzania") OR LIMIT-TO (AFFILCOUNTRY, "Argentina") OR LIMIT-TO (AFFILCOUNTRY, "Ethiopia") OR LIMIT-TO (AFFILCOUNTRY, "Uganda") OR LIMIT-TO (AFFILCOUNTRY, "Botswana") OR LIMIT-TO (AFFILCOUNTRY, "Lebanon") OR LIMIT-TO (AFFILCOUNTRY, "Bangladesh") OR LIMIT-TO (AFFILCOUNTRY, "Fiji") OR LIMIT-TO (AFFILCOUNTRY, "Jamaica") OR LIMIT-TO (AFFILCOUNTRY, "Rwanda") OR LIMIT-TO (AFFILCOUNTRY, "Sri Lanka") OR LIMIT-TO (AFFILCOUNTRY, "Ecuador") OR LIMIT-TO (AFFILCOUNTRY, "North Macedonia") OR LIMIT-TO (AFFILCOUNTRY, "Zimbabwe") OR LIMIT-TO (AFFILCOUNTRY, "Georgia") OR LIMIT-TO (AFFILCOUNTRY, "Uzbekistan") OR LIMIT-TO (AFFILCOUNTRY, "Mozambique") OR LIMIT-TO (AFFILCOUNTRY, "Nepal") OR LIMIT-TO (AFFILCOUNTRY, "Cuba") OR LIMIT-TO (AFFILCOUNTRY, "Iraq") OR LIMIT-TO (AFFILCOUNTRY, "Malawi") OR LIMIT-TO (AFFILCOUNTRY, "Mauritius") OR LIMIT-TO (AFFILCOUNTRY, "Mongolia") OR LIMIT-TO (AFFILCOUNTRY, "Myanmar") OR LIMIT-TO (AFFILCOUNTRY, "Papua New Guinea") OR LIMIT-TO (AFFILCOUNTRY, "Peru") OR LIMIT-TO (AFFILCOUNTRY, "Afghanistan") OR LIMIT-TO (AFFILCOUNTRY, "Albania") OR LIMIT-TO (AFFILCOUNTRY, "Cambodia") OR LIMIT-TO (AFFILCOUNTRY, "Laos") OR LIMIT-TO (AFFILCOUNTRY, "Morocco") OR LIMIT-TO (AFFILCOUNTRY, "Algeria") OR LIMIT-TO (AFFILCOUNTRY, "Armenia") OR LIMIT-TO (AFFILCOUNTRY, "Bhutan") OR LIMIT-TO (AFFILCOUNTRY, "Eritrea") OR LIMIT-TO (AFFILCOUNTRY, "Namibia") OR LIMIT-TO (AFFILCOUNTRY, "Solomon Islands") OR LIMIT-TO (AFFILCOUNTRY, "Somalia") OR LIMIT-TO (AFFILCOUNTRY, "Sudan") OR LIMIT-TO (AFFILCOUNTRY, "Syrian Arab Republic") OR LIMIT-TO (AFFILCOUNTRY, "Zambia") OR LIMIT-TO (AFFILCOUNTRY, "Antigua and Barbuda") OR LIMIT-TO (AFFILCOUNTRY, "Azerbaijan") OR LIMIT-TO (AFFILCOUNTRY, "Belize") OR LIMIT-TO (AFFILCOUNTRY, "Benin") OR LIMIT-TO (AFFILCOUNTRY, "Bosnia and Herzegovina") OR LIMIT-TO (AFFILCOUNTRY, "Central African Republic") OR LIMIT-TO (AFFILCOUNTRY, "Costa Rica") OR LIMIT-TO (AFFILCOUNTRY, "Dominica") OR LIMIT-TO (AFFILCOUNTRY, "Kiribati") OR LIMIT-TO (AFFILCOUNTRY, "Lesotho") OR LIMIT-TO (AFFILCOUNTRY, "Libyan Arab Jamahiriya") OR LIMIT-TO (AFFILCOUNTRY, "Macedonia") OR LIMIT-TO (AFFILCOUNTRY, "Moldova") OR LIMIT-TO (AFFILCOUNTRY, "Panama") OR LIMIT-TO (AFFILCOUNTRY, "Saint Lucia") OR LIMIT-TO (AFFILCOUNTRY, "Samoa") OR LIMIT-TO (AFFILCOUNTRY, "Senegal") OR LIMIT-TO (AFFILCOUNTRY, "Suriname") OR LIMIT-TO (AFFILCOUNTRY, "Tunisia") OR LIMIT-TO (AFFILCOUNTRY, "Undefined") AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (SUBJAREA, "SOC")) AND (LIMIT-TO (LANGUAGE, "English"))

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Appendix 2. Framework for quality appraisal of research articles

Criteria	Yes (1)	No (0)
1. Are the research questions or objectives clearly and appropriately defined?		
2. Is the research design appropriate for addressing the research question(s)/objective(s) and clearly presented in the article?		
3. Is the sampling strategy appropriately justified?		
4. Does the article clearly describe the setting of data collection?		
5. Is/Are the method(s) of data collection appropriate for addressing the research question(s)/objective(s) and clearly presented in the article?		
6. Is/Are the key concept(s) (e.g. PLC) clearly defined in the article?		
7. Is/Are the method(s) of data analysis appropriate for addressing the research question(s)/objective(s) and clearly presented?		
8. Is/Are the research question(s) or objective(s) answered?		
9. Are the discussion/conclusion(s)/implication(s) data appropriate?		
10. Is there evidence of attention to ethical issues?		
Total Score		

Yes = Score 1; No = Score 0. **High quality** = 8-10; **Medium quality** = 5-7; **Low quality** = 0-4

Appendix 3. Instance of data extraction in an abbreviated form

Author(s)	Year	Country	Research approach	Defining PLC	Key Findings
Rolando et al.	Rolando et al. (2014)	Brazil	Mixed Methods	Virtual communities are defined as a network to connect people who have common professional needs and interests.	Virtual Learning Communities supported sharing of content knowledge, teaching methods, instructional resources, and management of professional challenges.
Zhang & Yuan	Zhang and Yuan (2020)	China	Quantitative	A PLC refers to a group of teachers collectively interrogating and improving their practice through mutual learning and collaborative reflection with the purpose of promoting student learning	The organisation-centric factors of leadership, organisational structure, and culture are significantly related to teacher-centric factors such as collaborative inquiry and sharing and shared purpose and responsibility. This relationship influenced teacher job satisfaction.