



Improving teachers' professional development through professional learning community: Voices from secondary school teachers at Malaysian Chinese independent schools

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ABSTRACT

The impact of the professional learning community on teachers' professional development has been studied in different contexts. However, the number of studies on the voices of secondary teachers in Malaysian Independent Chinese Secondary Schools (MICSS) needs to be more detailed. This study aimed to investigate how teachers in MICSS view the impact of the Professional Learning Community (PLC) on their professional development. Data for this study was collected using semi-structured interviews with eight MICSS teachers selected from two different-scale MICSSs. The patterns were analyzed by repetitive data reading, data coding, and theme creation. The findings show that with the help of PLC, MICSS teachers may improve their professional development more effectively, particularly in enhancing their knowledge of their subject, students, effective teaching methodology, and sense of occupational belonging. Moreover, collective learning and classroom observation procedures are the most effective among all the PLC activities in the MICSS context. The findings have practical implications for teachers and trainers to improve teachers' profession by establishing professional learning groups.

1. Introduction

There is a common belief among scholars that a Professional Learning Community (PLC) is a cost-effective and popular Teachers' Professional Development (TPD) strategy [1,2]. Since the mid-1990s, there has been a new TPD paradigm. Therefore, teachers and school policymakers have become increasingly aware of its implications [3–6] and its contribution to TPD [7]. However, data on the relationship between PLC and TPD seems more detailed.

First of all, previously published studies on the contribution of PLC to TPD in the Asian context are few [7–9]. Previous relevant research was mostly conducted in western countries, such as American secondary and primary schools [3,4,10,11] and European countries [12–16]. However, Louis and Kruse [17] suggest that PLC could support TPD in all types of schools. They also believe it is essential to identify the benefits of PLC for TPD outside of western contexts. Thus, the influence of PLC on Asian teachers' professional development requires further in-depth studies.

There is now a consensus among education reformers and researchers [18–21] that PLC is a more practical approach to improving teacher effectiveness, skills, and practicality in the classroom than workshops, lectures, and symposiums [16,22–24]. However, two

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other researchers [25,26] argue that although many academic publications support the advantages of PLC, more studies are required to demonstrate how an effective PLC may be created and developed in a school context. It has also been proposed that researchers study PLC more extensively to allow it to serve teachers' professional growth more effectively [27].

Third, it is necessary to determine whether the application of PLC can guide the professional development of Malaysian secondary school teachers. Considering the Malaysian context, in addition to other countries, Hassan et al. [7] have raised several issues related to PLC, such as the background and development of PLC, the definition of PLC, the evolution of the concept of PLC, and the issues and challenges in implementing PLC. In another qualitative study, Lim et al. [21] discuss the impact of lesson study, a form of PLC, on the quality of mathematics instruction in a Malaysian-Chinese primary school. Nevertheless, Hassan et al. [7] and Lim et al. [21] have mentioned the specific operation of PLC in Malaysian schools and show the effectiveness of PLC in TPD in Malaysia. Two quantitative studies have recently been published, but neither directly addresses the impact of PLC on TPD in Malaysia. For example, Kin and Kareem [28] examined PLC as a strategy for long-term school development, while Khan et al. [29] identified the levels of PLC, TPD, and confidence among Malaysian secondary school teachers.

Finally, in the related studies conducted by different scholars, the professional development of MICSS teachers must be addressed. However [30,31], have briefly outlined the professional development requirements of MICSS teachers. In another study, Ling [32] examined the feasibility of implementing an apprenticeship learning strategy in MICSS and suggested an appropriate teacher-apprentice learning model for MICSS. In addition, a survey conducted by Qin and Yi [33,34] led to a proposal to improve the professional well-being of MICSS teachers by improving their professional quality. Although the above scholars claim that MICSS teachers must achieve their specialization through independent and collaborative strategies, it is challenging for MICSS teachers, who may not have thoroughly understood the theoretical knowledge of the teaching profession, to approach their professional development in this way reach [35]. Therefore, a discussion on the professional development of MICSS teachers and how they perceive professional development through PLC is still highly desirable.

2. Research objectives

Teachers' perceptions of the professional learning community and its effects on their professional development have been studied. However, to the best of the researchers' knowledge, the effects of the professional learning community on teacher professional development in MICSS teachers need further investigation. The current research aims to explore the implications of PLC on TPD in MICSS from the perceptions of secondary school teachers at Malaysian independent Chinese schools. More specifically, the current study addressed the following question:

How do secondary school teachers at Malaysian independent Chinese schools view the impact of professional learning groups on their professional development?

3. Review of the related literature

The related studies have been classified based on different themes: theoretical background, Supportive and Shared Leadership (SSL), Collective Learning and its Application (CLA), Supportive Conditions (SC), and Shared Personal Practice (SPP). The studies for each section are reviewed as follows.

3.1. Theoretical background

The Professional Learning Community (PLC) has become well-known to educators and school policymakers in recent years [36, 37], and scholars and researchers have analyzed it from various angles to do justice to its positive impact on the education sectors [2]. Hord et al.'s PLC model [37] focuses on helping teachers develop professionally [38]. All of these PLC models emphasized teachers' collaborative learning [39]. Hord [37] has extensively researched PLC, and her suggestions should not be disregarded. Therefore, Hord's PLC theory is used as the theoretical model for this study.

Drawing from her in-depth practice and extensive knowledge of the literature, Hord has reviewed a significant amount of research material and resources to deduce a systematic PLC theory, in which the five characteristics of PLCs have become the main content and the unique symbol of her PLC theory. By providing this framework, she has strived to reduce misunderstandings regarding PLC and supports its substantive and practical implementation [40]. Detailed explanations of the model's characteristics are presented in the following sections of this paper.

3.2. Supportive and Shared Leadership (SSL)

SSL is a critical component of successful PLC, as it helps teachers develop their inner qualities for their respective professional development [40]. It is easier to imagine how PLC could be developed in schools and how TPD could be realized within PLC [41]. SSL requires principals to create opportunities for teachers to adopt leadership roles and construct more conducive settings to help enhance teachers' leadership skills [42] and encourage teachers to work with school leaders to learn, ask questions, investigate, take risks, and find solutions to problems [43–45].

3.3. *Collective learning and its application (CLA)*

CLA emphasizes that teachers and their leaders should be collectively responsible for teachers' teaching and students' learning [46]. During CLA, teachers must explore suitable methods to transfer and apply what they have learned to their teaching and instructional practice. At the same time, school leaders need to identify ways to assess their effectiveness [47]. In this way, school leaders and teachers may maximize the benefits of collective learning and its application to their professional development.

3.4. *Shared values and visions (SVV)*

SVV is seen as a conventional guide to TPD in PLC [48] and may significantly impact teachers' teaching more than their race, gender, or experience [49]. Not only may SVV be a catalyst for improving teachers' classroom teaching practice by providing a clear image of what is essential for school staff and the entire school organization as a whole [42], and by raising awareness among staff of their school's mission [47], but it is also a guiding beacon for decision making in teaching and learning [50].

3.5. *Supportive Conditions (SC)*

The SC required by PLC encompasses the physical settings, the organizational structure, policies, and procedures teachers can use to satisfy their professional development needs [44,47]. SC provides essential infrastructure and requirements for teachers to learn decision-making or to implement new practices in more nurturing physical or structural settings, with mutual support and coaching [37,44,47]. Additionally, there is a need for PLC to cultivate positive attributes, such as mutual respect and trust among teachers [37, 44,51].

3.6. *Shared Personal Practice (SPP)*

SPP is the central factor for the ongoing development of PLC [17] and is the final characteristic of PLC [48]. In most cases, SPP is the last to evolve. Once implemented, it may become the measure and mean for the sustainable development of the other four characteristics [52]. It is similar to the concept of peer coaching, which includes accurate classroom observation and video sharing for TPD [42], as it is not an evaluation process but is part of a peer-helping-peers strategy [44]. With the five PLC characteristics in mind, a teacher may be more willing to actively participate in PLC by adopting and developing each of these [42]. In this way, a systematic change and an atmosphere of perpetual teachers' professional learning may emerge when the five characteristics are implemented thoughtfully [53,54]. As the theoretical framework of this study, Hord's five PLC characteristics have also guided the formulation of the research objectives.

4. Methodology

We used a qualitative case study in line with the study's objectives. A qualitative case study is a research method that enables researchers to explore a complex phenomenon by identifying different factors interacting. We used a qualitative case study to determine how PLC fosters teacher professional development at MICS schools. We gathered the data through open and semi-structured interviews with teachers from two schools in Malaysia, which were selected through purposive sampling.

4.1. *Research setting*

The study was conducted in two independent Malaysian Chinese schools, M1 and M2. The schools were selected through purposive sampling. M1 is a large-scale school with approximately 158 [2020] full-time teachers and nearly 2900 students. Located in the center of the Klang Valley, Malaysia, this comprehensive middle school, with a six-year schooling system, was built in 1923 and operated for 97 years. In contrast, M2 is a medium-scale school with 50 (2020) full-time teachers and 684 students close to Port Dickson, Malaysia. It is similar to M1, as it offers a six-year schooling system. M2 was established much earlier than M1 was established, as it was built in 1914 and operated for 104 years.

4.2. *Participants*

The participants of the study were selected in two phases. First, with the help of on-site observation, two schools were selected through purposive sampling. Then, from the teachers at the selected schools, about 16 teachers with different teaching experiences were nominated and invited for interview. As the data saturation occurred when the 8th teacher was interviewed, only 8 MICS teachers were included in the study as the informants [respondents]. They provided in-depth information about the implications of PLC for their professional development. The respondents' age ranged from 25 to 32 ($M = 28$), and their teaching experience ranged from 5 to 25 years ($M = 13$). The teachers recruited for the study were male ($n = 5$) and female ($n = 3$). To observe the ethical considerations, we used pseudonyms (R1 to R8) to hide the real identities of all respondents.

4.3. Data analysis procedure

First, the school and the respondents were selected. They were interviewed individually at the schools in which they teach. Each interview took approximately 40 min. The interviews were carefully transcribed word by word. The researchers reviewed the entire transcript and looked for meaningful patterns in themes across the data. The patterns were analyzed by repetitive data reading, coding, and theme creation. Fig. 1 shows the flow of the process.

The themes were identified, revised, defined, and exemplified. Two coders analyzed the interviews and agreed on the extracted codes and themes.

4.4. Ethical considerations

This study was approved by the ethical committee board of University of Malaya, 50603, Kuala Lumpur, Malaysia. The committee board issued a letter (Number: 161235) indicating that the study has no side effects on the participants of the study and it does not violate the ethical considerations. Also, the informants willingly agreed to participate in the study and signed in the informed consent form.

5. Findings

The interviews with 8 respondents (henceforth R) were transcribed, and 4 main themes were extracted. Each theme is explained and explained in the following sections.

A: PLC, through collective learning promotes TPD more effectively

As suggested by all interviewees, the first extracted themes were thematically coded as follows: PLC through collective learning promotes TPD more effectively. The interviewees all agreed that among all of the PLC procedures, collective learning, and classroom observation might help promote TPD more effectively in MICSS; For instance, R3 explained:

The outcomes of these two sessions are not only the teaching contents improvement but also the enhancement of teachers' teaching methods, skills, ability to transmit knowledge, ability to communicate with students, and ability to conduct classroom teaching practices (R3).

The uniqueness of MICSS means that they cannot consistently recruit fully qualified teachers for some subjects, and due to the high turnover rate, it is common for one teacher to teach several subjects simultaneously. As respondent 6 states, teachers facing these challenges need to rely on collective learning to organize subject knowledge and clarify subject priorities. R6 regarded "overcoming one's shortcomings by learning from others' strengths" as the primary purpose of collective learning within PLC in MICSS. Moreover, as teaching materials change along with social development, and because some contents may be more closely related to everyday life, R6 proposed that senior teachers combine their lived experiences to provide examples to help novice teachers better understand the teaching contents within collective learning. This finding was confirmed by R5, who stated:

"... The development of society will prompt the adjustment of the curriculum's content, adding or deleting some chapters, and newly added chapters need to deepen the teachers' understanding through their continuous collective learning." (R5)

Hence, she urged all M2 teachers to be open to sharing and accepting ideas from one another during collective learning. R7 also maintained that PLC-based collective learning allows teachers to present different interpretations of subject knowledge and deepen their understanding through mutual consultation. He offered the following advice to novice teachers:

They need to observe the process conducted by others and point out their suggestions based on their own theoretical knowledge and the practical knowledge interpretation methods used by their secondary school teachers (R7)

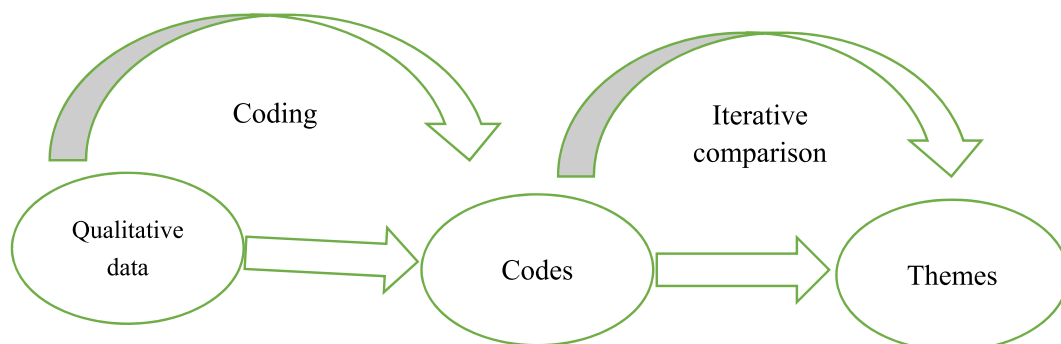


Fig. 1. The process of qualitative data analysis.

Given that the function of PLC is helping MICSS teachers develop a deeper understanding of their subject knowledge, R8 hoped that M2 teachers would rigorously implement the content, planning, and instructional design that is formed within collective learning and stated that :

If not, the essence of collective learning will not occur, and colleagues' trust and respect will also decrease (R8). For R4, in M1, the significant benefit he has obtained is a more profound understanding of her subject knowledge. In her view, the critical purpose of PLC conducted among the *Bahasa Cina* [BC] teachers is to communicate with one another on teaching methods for the same content. R4 quoted:

... teachers can discuss all the objectives that emerged, thus deepening their understanding of the discipline, and presenting comprehensive teaching contents ... [R4]

R4's understanding is supported by R1, who stressed that one of the most intuitive advantages of collective learning is that it may provide opportunities and platforms for teachers to share knowledge and understanding of the constantly evolving teaching contents and materials. He further explained:

Sometimes, teachers may ignore specific knowledge, which may be compensated through collaborative lesson planning so that all teachers can transfer more comprehensive knowledge to students, and the additional content or materials required by the course are constantly updated [R1].

To maximize the benefits of collective learning, R1 suggested that teachers maintain a positive attitude and share their understanding to achieve the shared vision of enhancing teachers' classroom teaching practices. Furthermore, R3 appealed to M1 teachers to attend collective learning with a continuous-learning mindset, particularly those with higher teaching seniority. She explained that:

With the increase of teaching seniority, teachers will soon fall into their own set of habitual teaching ideas or methods and cannot cater to the development trend of more diversified student if teachers do not consider students' changes ... one day, they will be eliminated [R3].

She further noted that M1 teachers ought to be fully engaged in collective learning to establish their knowledge base of each subject. This may help support newly enrolled teachers efficiently. R2 also believed that through collective learning, teachers might form a detailed understanding of their subject.

B: PLC enhances MICSS teachers' knowledge of students

The second benefit teachers may obtain from collective learning is an improvement in their understanding of their student's learning habits. In R3's view, teachers' knowledge of students is essential, and striving to maintain a healthy relationship with his students has been an essential goal of his teaching career. He recalled that:

One student told me that he disliked the subject that I teach, but in his eyes, I was friendly and got along so well with all the students, then he would do his best in my class ... "(R3)

He further highlighted that before outlining their instructional design, teachers should become familiar with all their students and their learning abilities. Then the students may improve their learning outcomes with the assistance of teachers. He believed that if this is not undertaken, teachers' attempts to improve their students' performance may be ineffectual.

R8 also emphasized that a good teacher-student relationship is a prerequisite for teachers to carry out teaching tasks successfully. Teachers, especially novice teachers, might also improve their knowledge of students through collective learning. R7 concurred with this view and added that the role of collective learning in enhancing teachers' knowledge of students is more evident in medium-scale and small-scale MICSSs. He elaborated:

M2 is medium-scale, and the number of teachers and students is not too large, so generally, the teacher will be familiar with each student, and senior teachers can share what they know about the students with novice teachers during collective learning. [R7]

For describing how her enhanced knowledge of her students gained through collective learning has affected her teaching practice, R6 shared that she has obtained considerable benefit, which has caused her to transition the strategies she uses to interact and communicate with her students from those of "strict discipline" to those of "encouragement."

However, R4 did not believe that M1 teachers' knowledge of students would deepen as a result of engaging in collaborative learning, explaining that:

R4: "... this knowledge needs to accumulate through enriching teachers' teaching experience, especially in large-scale MICSS with thousands of students"

The difference between respondents' understanding of the benefits of enhancing teachers' knowledge of students may vary depending on the scale of the school. Moreover, teachers teaching in relatively small-scale MICSSs may benefit more than those in large-scale MICSSs. This may be particularly true of teachers with lower teaching seniority.

C. PLC enhances MICSS teachers' knowledge of teaching methods

Enhancing MICSS teachers' teaching methods are at the heart of all types of MICSS teacher training. In this study, R3 (M1) and R8 (M2) shared that 70% of teachers have no background in the teaching profession (the rate is far higher than the national average rate:

of 44.27% in 2020) and tend to be lacking in teaching methodology that may help to motivate students to learn, so PLC has likewise become a means for MICSS teachers to improve their teaching methods, through attending collaborative learning sessions and participating in classroom observation. In this particular case, the eight respondents agreed.

In addition to organizing subject knowledge, additional time is spent on collaborative learning among MICSS teachers in order to learn teaching methodology. R3 proposed that:

R3: "The function of collective learning is not only to make corrections but also to remind teachers to update their teaching methods constantly because the age group of students gets younger, and this purpose cannot be achieved without the assistance of collective learning."

She further highlighted that MICSS teachers should master new teaching methods to help motivate their students' learning. In her view, traditional teaching methods are correct, but the updated ones are essential. Hence, M1 teachers need to reflect on their daily teaching practices to deepen their understanding of teaching methodology. R2 agreed and noted that:

Compared to the new generation of teachers, teachers with higher seniority may apply traditional teaching methods. During collective learning, senior teachers need to learn the techniques applied by novice teachers and allow their students to play games and perform discussions to master the subject knowledge [R2].

According to R1, R4, and R6, apart from learning from one another within collective learning, teachers also need to brainstorm to inspire the development of their expertise to promote the application of emerging effective teaching methods to ensure that all teachers may obtain significant benefits from collective learning.

R5 also advocated that teacher with higher teaching seniority should continuously refine their teaching methods and generate new ways of transferring knowledge to impart knowledge in a more acceptable way to their students with the assistance of collective learning.

Given the positive impacts of collective learning on enhancing M2 teachers' teaching methods, R7 pointed out that more attention should be given to the teaching methods within the future collective learning sessions in M2, as in his view:

Teaching methods are more important than the teaching contents, and the main teaching purpose is, with the help of suitable teaching methods, to teach students to apply what they have learned to solve real-life problems ... [R7].

However, R8 claimed she learned more about teaching methodology from classroom observation than collective learning. She focused on the observed teachers' teaching methods and asked herself how alternative teaching methods could transfer the same teaching content. She believed that doing so allowed her to observe the positive aspects of each teacher's teaching methodology. As a result, she has now gained a greater understanding of different teaching methods to use while teaching.

R3, R4, and R7 also believed that classroom observation might enhance MICSS teachers' teaching methods more effective than collective learning. According to R4 and R7, teachers observing others may gain greater insight than those performing the teaching practice. They suggested that by observing others' teaching practices, teachers might view their shortcomings, which may make the targets of subsequent professional growth clearer. Observing the classes of teachers with higher teaching seniority, novice teachers might learn more. R3 stated that:

There is a big gap between teaching theory and practice, although the teacher has already rehearsed all aspects and processes of teaching in his mind during collaborative lesson planning, the effectiveness of the classroom teaching practice will be significantly reduced due to other factors [teacher-student interaction] that needs to be taken into account ... [R3].

To this end, R5 recommended that all MICSS teachers, regardless of whether they work at small-scale, medium-scale, or large-scale MICSSs, and regardless of teaching seniority, need to enhance their teaching methods through collective learning and observation of one another's classroom teaching practice.

D. PLC improves MICSS teachers' sense of occupational belonging

The difference between MICSS teachers and "Sekolah Kebangsaan" teachers makes it necessary to improve MICSS teachers' sense of occupational belonging, particularly for novice teachers. R6 emphasized that MICSS teachers' social recognition needs to be higher. As a result, younger teachers at MICSSs (mainly small-scale MICSSs or some medium-scale MICSSs) think of their job as a starting point and try to look for more lucrative job opportunities to appear. In such cases, they generally tend to leave. She further asserted that:

Through PLC, senior teachers may see more targeted challenges and provide more targeted support, improving novice teachers' sense of belonging ... When novice teachers are united with colleagues, get along well with the students, and see the positive impact that he or she has on the students' learning, they may be less concerned about external factors, such as salary, and will not resign [R6].

According to R5 and R7, novice teachers, especially those without any teaching experience, generally tend to be nervous when performing classroom teaching. However, they may develop greater confidence through the help of collective learning, in which the teachers with higher teaching seniority provide them with more information about the discipline content knowledge, teaching methods, and the students' learning abilities. This information may help novice teachers effectively conduct their classroom teaching practice and improve their sense of occupational belonging. Besides collective learning, in R5's view, classroom observation may also make some valuable contributions:

novice teachers need to observe senior teachers' teaching practices, especially the practice of those who teach the same subject and same grade, where they can more effectively learn the teaching methods employed by senior teachers and apply what they have learned to their classrooms to improve the effectiveness of their classroom teaching practice and their sense of occupation belonging [r5).

In R3's view, MICSS teachers' sense of occupational belonging is derived more from their students. PLC may improve teachers' sense of professional belonging because it may more directly address classroom management problems commonly experienced by teachers possessing lower teaching seniority and, therefore, less classroom teaching experience. R3 mentioned that:

I often hear novice teachers say that they work hard every day and try to apply what they learn in PLC to their daily teaching. However, there are still students who ignore the lessons and who even eat or sleep in class, and these novice teachers don't know what to do and even start to doubt whether they are fit to be teachers (R3).

Therefore, R3 confirmed that PLC might be used to improve MICSS teachers' sense of occupational belonging. However, in R4's view, this may not be the case. She explained that:

Although, within collective learning, the teachers form a consensus on the primary teaching content, which can be transmitted in diverse ways according to the teachers' level of experience and the students' learning habits. Students' attention to a lesson is unrelated to the written lesson plan [R4).

R3 emphasized that whether PLC contributes to MICSS teachers' sense of occupational belonging depends on their level of preparation and their mindset towards each PLC activity; this is particularly true of the mentality of senior teachers. According to R1 and R3, collective learning and classroom observation are effective procedures for novice teachers trained by a mentor (the senior teacher). With the assistance of a mentor, novice teachers may be less nervous about performing their classroom teaching practice, and the assistance of a mentor may increase novice teachers' confidence levels.

In R3's view, novice teachers may be viewed as "seeds" which require time to "germinate" and whose development needs to be carefully nurtured. To conclude, excluding R4, the other seven respondents agreed on the implication of PLC in improving MICSS teachers' sense of occupational belonging, particularly for novice teachers.

6. Discussion

This study has explored the implications of PLC on MICSS teachers' professional development in line with the theoretical framework obtained from Tobia and Hord [37], Roy and Hord [1], and Hord [42]. The findings revealed that PLC enhances TPD through collaborative learning. Interviews with the teachers revealed that MICSS enhance their pedagogical content knowledge and improves their sense of occupational belonging through participation in PLC, where collective learning and classroom observation are the most effective techniques based on the qualitative findings. In line with the conclusions made by Louis and Kruse [17], it can be inferred that the pedagogical content knowledge of the MICSS teachers (e.g., their subject knowledge, their knowledge of students, and their knowledge of teaching methods) can be improved when the teachers use PLC procedures and activities. The self-efficacy of MICSS teachers, particularly the sense of belonging to the profession among beginners, can also be improved with PLC support.

Furthermore, it can be inferred that because of the challenges and problems associated with all PLC activities in MICSS at present. Collective learning and classroom observation are the most feasible and useful PLC activities. The main reason for the dominance of collaborative writing and classroom observations over the other PLC activities was the researchers' inability and failure to determine the impact of PLC activities such as Feedback meetings and self-reflection.

According to this research, collective learning may be crucial for achieving TPD in MICSS because it helps teachers acquire new knowledge of the subject and new teaching methods. This finding confirms the findings by Foong et al. [53] and Ostovar-Nameghi and Sheikahmadi [54]. Similarly, Hallam et al. [51] and Ronfeldt et al. [62] conclude that collective learning supports teachers in developing their profession through an in-depth understanding of textbook knowledge and the corresponding teaching methods. Also, Ning et al. [63], Doğan, and Yurtseven [64] advocate that teachers may enhance their professional teaching skills through collective learning by learning with and from one another. The function mentioned above of collective learning is consistent with the findings of this study, where collective learning has been perceived as helping MICSS teachers to improve their subject knowledge and teaching methods, in addition to other important related skills.

Collective learning may also allow teachers to exchange ideas, knowledge, and strategies with one another to increase the flow of knowledge required in the teaching profession. This has been confirmed and accepted by Schildkamp et al. [65] and Popp and Goldman [66]. Furthermore, Goddard et al. [67] and Hoque et al. [68] highlight that collective learning may prove to be an essential way to develop teachers' inner qualities, through which they may gain confidence and develop the necessary skills and knowledge to completely address the challenges they may face encounter in their daily teaching practice. This is also consistent with the findings of this study, in which the role of collective learning in improving MICSS teachers' sense of occupational belonging, particularly that of novice teachers, has been highlighted.

In line with the assertions of Hammersley-Fletcher et al. [69], Cilliers et al. [55], Alicea et al. [56], and Stoll et al. [70], this study has also discovered that MICSS teachers may gain understanding and broaden their pedagogical content knowledge from one another's classroom teaching practices, as a means of achieving professional growth [71]. The observed MICSS teachers and the observers share many similarities, which may make it more acceptable to provide feedback on one another's classroom teaching practices [72]. The function of classroom observation in TPD in MICSS explored in this study is also consistent with the findings of Huffman et al. [5], Johnson et al. [73], and Patton and Parker [74], who assert that classroom observation may improve teachers' ability to develop a

sense of ownership in their professional development, by encouraging them to ask probing questions about themselves and others, which may be of benefit to their TPD requirements.

Findings also revealed that, within classroom observation practices, novice teachers may develop an improved understanding of teaching content and teaching methods by actively sharing their classroom teaching practice with their peers. Furthermore, senior teachers may gain increased knowledge of contemporary instructional design and methodology. This is because classroom observation is a conscious activity engaged in meeting TPD needs through the observation of one another's teaching practice and reflection on what has been observed. This finding has also been reported by Goddard et al. [67], Ostovar-Nameghi, and Sheikahmadi [54].

The findings are also consistent with the conclusions made by Cilliers et al. [55], Alicea et al. [56], and Lim et al. [21]. They maintained that MICSS teachers gain more opportunities to compare one another's classroom teaching practices to deepen and expand their understanding of teaching content, teaching skills, and instructional designs, and this may make it more accessible for MICSS teachers of the same subject department to learn more about their students' learning abilities and to perform their classroom practice more effectively.

Consistent with the findings reported by the OECD [57], MICSS teachers are also more likely to make fundamental changes when exposed to new ideas and practices, in addition to observing others' practices. It can also be inferred that novice teachers may obtain more from classroom observation practices, in which they may capture a whole, vivid, and dynamic picture of the senior teachers' classroom teaching practice and discuss this with their peers so that they may improve their teaching skills more efficiently than by focusing solely on the acquisition of theoretical knowledge. This finding was also reported by Nava et al. [6], Chen [58], and Pang and Marton [46].

However, this study's findings differ from the suggestions made by a few researchers [59–61]. They have concluded that teachers and school leaders may need to be more effectively equipped and may need to become more efficient as a whole to increase their motivation to stay abreast of the latest developments and trends in the field of education through the application of collective learning. In the current study, MICSS principals were not involved in teachers' collaborative learning, and according to the respondents, generally, they did not play a meaningful role in TPD. Some respondents even reported that some MICSS principals needed more understanding of TPD or had no clear idea of how they might more effectively support teachers in achieving their TPD goals.

7. Conclusion

This study explores the implications of PLC for MICSS teachers' professional development in two MICSS of different histories and the number of students. The findings indicate that MICSS teachers may leverage PLC to satisfy their TPD requirements, especially for the enhancement of their pedagogical content knowledge and self-efficacy; more specifically, with the assistance of PLC, MICSS teachers may enhance their knowledge of their subject, their students, and teaching methods, in addition to improving their sense of occupational belonging.

The strength of this study is its novelty. The effect of the professional learning community on the teachers' professional development has yet to be studied. Another strength of the study is its practical implications. Teachers of different subjects, regardless of the context in which they teach, might develop their profession by joining professional learning communities.

Like the other qualitative studies, the study suffered from some limitations. First, the sample size was small, as the study was context-specific. Second, the data were collected through semi-structured interviews, while focus group interviews and observations could have been used as data collection instruments.

Despite the limitations, this study not only lays the groundwork for future researchers to explore the implications of PLC on TPD in Malaysia fully, it also provides MICSS staff with the confidence needed to continue to employ PLC to support their pursuit of TPD. As the researchers recruited teachers only from secondary schools, the other researchers are suggested to investigate the impact of PLC in different types of Malaysian schools using a variety of research methods [quantitative and qualitative] and research samples, thereby profoundly delving into the different roles played by PLC in various schools and the underlying reason.

Production notes

Author contribution statement

Bao Guo An: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data.

Nina Wang: Conceived and designed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Data availability statement

Data will be made available on request.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix

Interview Questions

- What do you know about the professional learning community?
- How might it affect teachers' profession?
- How does PLC, through collective learning, promote teachers' professional development?
- How does PLC Enhance MICSS teachers' knowledge of students?
- Does PLC enhance MICSS teachers' knowledge of teaching methods? Please explain how?
- How might it affect teachers' sense of belonging?

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