

Developments of Professional Learning Communities and Challenges for Principals in Chinese Urban Middle Schools

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ABSTRACT

Professional learning communities (PLCs) have seen a rapid spread all around the world over the past 30 years. Since then it has been proved that they can improve teaching quality and thereby the achievement of students, and so PLCs have attracted increasing attention especially from education systems. In China, PLCs have been developed vigorously within schools since the implementation of the 'New Curriculum Reform' in 2000. However, the west has paid scant attention to and were not familiar with them since most research in this field in China was published in Chinese. Furthermore, PLCs are influenced by contextual and cultural factors, and therefore PLCs in Chinese education systems are different from those in Anglo-American settings due to long-standing cultural differences, which require consideration. Therefore, this research will investigate the PLCs in China that may be of interest. Many recent studies have shown that, although PLCs have made significant progress in Chinese urban middle schools through the enthusiastic efforts of educators and scholars, there are still several barriers. The primary purpose of this research is to review the development of PLCs and additionally to analyse the challenges faced by the principals.

1. Introduction

This research will focus on the PLCs in Chinese urban middle schools, and there are two reasons. Firstly, PLCs play a vital role in Chinese middle schools. According to the article 17 in chapter two of the Education Law of the People's Republic of China^[7], China's education system

includes pre-school, elementary, secondary and higher education. However, only elementary (six years for primary schools) and secondary education (three years for middle schools) are included in compulsory education. In other words, "all children who have reached the age of six shall enrol in school and receive compulsory education" until they graduate from middle schools after taking the

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Zhongkao (Senior High School Entrance Examination)^[8]. Surprisingly, high schools are not covered by compulsory education, which means that high schools select students based on their *Zhongkao scores*, instead of being open to all. Thus, the result of *Zhongkao* is crucial for students. Previous research has established that PLCs have a positive and significant influence on enhancing student academic achievement^[9]. Taken together, that is why I choose Chinese middle schools as the context. The second reason is my personal experience. I have been living and studying in Nanjing (one of the provincial capitals in China) for 23 years and therefore, I have a better understanding of the educational contexts in urban areas compared to rural ones, and that is why I prefer to focus on urban areas.

The three main search engines used in this research are Google Scholar, NUsearch and NKI (China National Knowledge Infrastructure). ‘professional communities’, ‘learning communities’ and ‘teacher communities’ were chosen as keywords because of the ambiguous terminology of PLCs^[4], added with ‘middle school’ and ‘principal’. Additionally, ‘China’, as a qualifier, was used to restrict the literature to that published in China when I used the CNKI. Based on these search parameters, 9,569 results were found on NUsearch, while 289,000 in Google Scholar. Given the immensity of the literature, I only selected those conducted in the last 20 years (2000-2020). To increase reliability, I used ‘peer-reviewed journals’ as one of the inclusion criteria on NUsearch. Meanwhile, to ensure appropriateness, I selected ‘Education’ as another criterion on NUsearch and added ‘intitle’ before the keywords in Google Scholar. After being processed, the result reduced to 5,237 and 17,300 respectively in NUsearch and Google Scholar. At the same time, 2,580 results were available since 2000 after entering the same keywords in Chinese in CNKI, with 1,540 in the field of secondary education and 513 in the educational leadership and management. Besides, it can be found that the number of the literature is continuously on the rise and this finding holds for all three engines. This filtered literature, as the initial pool, was the main source of this research. It should be noted that, due to the particularity of the content, some of the literature in following part on the origin of PLCs, was from before 2000.

The overall structure of this research takes the form of four parts, and the remaining part of it proceeds as follows: literature review, application, and conclusion. The literature review first gives a thematic overview of PLCs, including the definition, characteristics, origin, developments and challenges for principals, mainly from an international perspective. The research on the definition,

characteristics and origins is conducted in a more macro way, while analysis on developments and challenges is conducted in the context of international middle schools. Then, the analysis in the application is from the perspective of China. In this part, the same themes are used to explore the PLCs in the Chinese context, but the research object of developments and challenges is narrowed down to the PLCs in Chinese urban middle schools. The summary and comparison are in conclusion, along with the evaluation.

2. Literature Review

2.1 The Concept of Professional Learning Communities

The foundation of PLCs has been built since the early 1990s^[1], and there are various definitions of PLCs within academia^[10]. However, not all of these definitions can be applied to this essay because PLCs seem to have different meanings in different communities^[11]. Scholars have tended to regard “PLCs as an umbrella concept covering many representations of communities”^[4], either in society or schools, like communities of practice, learning communities and cross-schools staff networks^[12]. This research only focuses on PLCs within school contexts. Therefore, PLCs is defined as:

“inclusive and mutually supportive group of (professionals) with a collaborative, reflective and growth-oriented approach towards investigating and learning more about their practice in order to improve all students’ learning.”^[13]

The within school PLCs can help teachers to remove learning barriers and generate new knowledge^[14] by providing regular, ongoing opportunities for teachers to discuss teaching issues in their daily practice and share professional expertise critically^[4].

Despite the definitional issues, there are five common key characteristics of PLCs summarised by many scholars: shared values and vision; collective learning and application; reflective professional inquiry; and shared and supportive leadership^[15]. Additionally, they also highlighted supportive conditions which include structural conditions, like time and resources^[16] and cultural ones, including mutual trust and inclusive membership^[11]. Newmann et al.^[9] described these characteristics within schools as follows. Firstly, shared values and norms are built to “concern the student learning ability, school priorities, and the appropriate role of teachers, administrators, and parents.” Secondly, collective learning and application has two meanings: PLCs in schools centre on collaborative learning which is different from traditional

learning. Furthermore, teachers not only gain professional knowledge and improve teaching quality together, but also put them into practice to enhance students' academic achievements^[17]. The third characteristic can be interpreted as the reflective dialogue among teachers about curriculum, instruction, and student improvement. Supportive and shared leadership from principals can make PLCs flourish by offering professional training to teachers and letting them participate in decision-making^[18]. Almost all activities in PLCs can be reinforced by supportive conditions such as mutual trust and respect^[6]. Based on this, some analysts^[19] concluded that shared values, collective learning and application, and reflective professional inquiry could be operationalised at the individual teacher level, while shared leadership and supportive conditions are regarded as being at the organisational level since they indicate how school organisations support teachers' collaborative.

2.2 The Origin of Professional Learning Communities

Based on the analysis of many published studies, the formation of PLCs in schools was stimulated by many reasons^[20]. These reasons will be analysed starting with external factors (macro) and moving on to the internal (micro) level.

Many external factors influence the formation of PLCs within schools. Peter Senge first proposed the concept of 'learning organisations' in his book *The Fifth Discipline*. According to him, learning organisations serve to help people learn together and increase organisational capacity and creativity. Over the next year or so, this concept caught the attention of educators and was gradually introduced into the educational environment^[20]. Meanwhile, educators were also inspired by the organisational learning culture in business which can help managers and staff to meet customer needs by nurturing individuals and supporting collaborations. With further development, organisational learning caught fire in the educational world^[20] and as educational researchers further explored it in literature, the term changed to the 'learning communities'^[21]. In addition, the formation of PLCs in schools was also affected by national reform policies^[22]. Over the past 20 years, reformers have turned their critical attention to teachers' professional learning^[9], for they believed that the quality of students' educational experience depends largely on the quality of teachers. To enhance the quality of teachers, national reform agendas required teachers to rethink their practice in terms of the need for ongoing professional learning. In other words, teachers should "develop dual capacities of both teaching and learning and

builds new visions of what, when, and how they should learn collaboratively and use knowledge"^[9]. This illustrates the origin of the 'learning communities' and 'professional learning' in school-based PLCs.

There also exist internal reasons for the formation of PLCs. As Hammond and McLaughlin^[22] found, previous school improvements were based on the textbooks and curriculums that were selected by educators. However, these previous improvements can only have a short-term effect because of the lack of broad participation of teachers. To reverse this situation and nurture teachers' willingness to engage, PLCs came into existence as a new and valued strategy. Teachers in PLCs had to participate in collegial and professional activities to enhance student learning^[23]. With greater autonomy and supportive feeling, they also had more enthusiasm and efficacy than before. With the support and promotion of many scholars^[24], PLCs were gradually established in schools. Currently, PLCs have been identified as a common code of practice among teachers to meet students' needs across the globe^[25].

2.3 Developments of Professional Learning Communities

PLCs, as a powerful vehicle to achieve desired student outcomes, is endorsed by many scholars^[26]. According to them, successful PLCs in middle schools have the capacity to boost student learning by improving teaching and instructional practice. It is, therefore, possible to hypothesise that well-developed PLCs have a positive influence on both teaching practice and student learning. This assumption was indeed confirmed by Vescio et al.^[9], who analysed the impact of PLCs on teaching practices and student learning.

In terms of teaching practice, it can be concluded that the positive impacts of successful PLCs can be demonstrated in three ways, based on the multi-site study from Louis and Marks^[27]. The first one is being more student centric. The data from a two-year comparative study commissioned by the Annenberg Institute^[28] indicated that when teachers participate in professional groups with critical friends, their teaching practice will focus on students, their needs and interests, and try to meet them. The second one is having more effective teaching approaches and strategies. Hollins et al.^[29] studied teachers to see how they taught African American students with poor grades successfully. They found that when teachers work together through professional learning meetings which focus on students, they could design better teaching approaches and strategies for students more quickly. For example, in this study, they created a new writing process approach to teach language arts instruction, including letter writing

and a poetry project. During this process, to help students understand and make new words, teachers adopted strategies like ‘visualisation techniques’ as well as flash cards. The third positive impact of successful PLCs is innovation. Little ^[14] asserted that sharing wisdom and knowledge gleaned from daily experience can also help teachers to instigate and promote new behaviours in classrooms, which can further lead to significant systemic changes ^[30]. In addition, for teachers, successful PLCs can improve their efficacy and effectiveness ^[14], job satisfaction, morale and commitment, which contribute to reduced rates of absenteeism and turnover ^[31]. Meanwhile, PLCs can also help teachers to pay more attention to lifelong and continuous learning ^[6].

Harris and Jones ^[14] reinforced that PLCs can benefit learners, and this viewpoint has been confirmed by Phillips ^[32]. Phillips observed and recorded underachieving students in a middle school for three years. In that middle school, teachers set up PLCs to improve student academic performance through joint efforts. As a result, students’ scores improved dramatically. In the national standardised tests, the passing rate on subject areas has almost doubled, and this phenomenon can also be seen in other middle schools with successful PLCs ^[33]. Supovitz and Christman et al. ^[34] further found that student performance changed with the strength of school PLCs. After adjusting for the grade level and student background, Louis and Marks ^[27], added that “student achievement was significantly higher in schools with the strongest PLCs [and] this effect was so strong that the strength of the PLC accounted for 85% of the variance in achievement.” What should be noted is that these improvements are achieved only through successful PLCs, that is, “teachers collaborate closely and focus on the ‘real work’ of improving learning and teaching” ^[14], rather than “those shallow or empty communities where teachers worked together but did not engage in structured work that was highly focused around student learning” ^[9]. At present, although there are limited published studies that explore the impact of PLCs on teaching practice and student learning in middle schools, according to the available literature, we can still confirm these positive impacts. Moreover, our interpretation of these studies can lead us to future research and call for more studies.

2.4 Challenges for Principals

Although school-based PLCs can bring many benefits, it is not easy to create and sustain them. In reality, building and maintaining of PLCs can be hampered in many ways, including personal factors, like personal family issues and personal, professional development structures; school factors, including the guidance provided by prin-

cipals; and social factors, including social status ^[35]. This section will focus on principals and the PLC challenges they face in middle schools.

2.4.1 The Role of Principals in Professional Learning Communities in Middle Schools

Various studies have assessed the importance of principals and, according to them, principals play a fundamental role in building and maintaining PLCs in middle schools ^{[14][36]}, and their support is one of the most critical resources, even though their roles may change as they share leadership responsibilities. Prestine ^[36] concluded their support role was as follows: As the agent of change ^[21], principals can build both school culture and context for PLCs to work ^[14]. Several scholars have argued that it is the school culture that has the most effect on PLCs ^[37]. This suggests that heads can create a school culture that is conducive to learning at all levels, including students and teachers ^[2]. According to Louis and Kruse ^[36], student learning is the abiding focus of PLCs. Meanwhile, in the Turning Points 2000, Davis and Jackson ^[38] highlighted that it is principals who play the most significant role in enhancing and maintaining student achievement in middle schools. As the lead learners and managers of the learning process ^[21], principals can improve students’ academic performance indirectly by developing teachers so that they can meet the needs of students and overcome educational challenges in middle schools ^[39]. When it comes to developing teachers, Leithwood and Jantzi ^[40] pointed out that principals can support middle school conditions to facilitate the organisational learning process. Therefore, as leaders and managers of schools, principals have the job of creating collaborative communities, so that teachers can learn continuously in it ^[21]. At the same time, principals also have a supervisory role. Based on Bryk, Camburn, and Louis ^[41], the supervision of principals can positively influence PLCs in middle schools and further enhance the organisational learning capacity of teachers. It is also the principals’ responsibility to establish an open context of high professional respect and trust to support collective responsibility and collaboration among teachers ^[35]. In this kind of work setting, teachers can change practice and innovate safely ^[14].

The leadership of principals is also a pivotal element ^[43]. According to Harris and Jones ^[14], PLCs require specific forms of leadership to be successful and tenable and principals can provide shared leadership as a support ^[42]. This can provide teachers with common goals and values that focus on improving student achievement ^[43]. By building a learning school culture, PLCs underline the development of teacher knowledge and practice via sharing and joint

inquiry, which requires middle school principals to lead teachers in focused and disciplined collaboration^[43]. In this process, principals need to give up their omnicompetence and devolve power to share their leadership and encourage teachers to learn together and participate in decision making^[36]. In middle schools, “the opportunities for releasing interdependent learning capacity within schools and across the system is maximized”^[10]. In terms of creating a quality context, sharing leadership with teachers can ensure the decentralisation of power, so that “teachers will be highly motivated to do the work needed to ensure all students meet school assessment expectations”^[43]. However, the lack of sharing leadership can cause a ‘toxic culture’^[44], which “promote teacher isolation, decreased staff morale and decreased job satisfaction”^[43].

2.4.2 Challenges

The role of principals, especially the supportive role, has been described above. However, in practice principals still encounter various challenges. The first challenge comes from the school culture. According to the above, it has been already known that one of the roles of principals is to establish a school culture and context suitable for PLCs. However, there is a dominant culture in almost all middle schools that either supports or weakens innovation and change. New initiatives can be resisted when the culture does not support them^[14]. To alleviate this, principals should not only give corresponding support and champion from the top to establish the centrality of PLCs in the school, but to drive structural conditions for change and school improvement^[45]. Otherwise, even if the related buildings of PLCs can overcome the initial resistance, they will still have little influence or lose momentum without further development. In the end, staff may lose faith in this way of working^[14]. The second challenge comes from teachers. In some schools, PLCs meet with resistance from those teachers who have their own beliefs and models about teaching and learning^[36]. When they are not familiar with PLCs, they may feel suspicious and will not support it. Without the support of teachers, PLCs are difficult to set up^[14]. Another challenge for principals in establishing PLCs is time constraints. Joint work takes time. Some teachers think that they already have too much work and there is no time for participating in PLCs. Meanwhile, others suppose that it is difficult to find the same time to engage in PLCs due to the different schedules. Without enough and fixed time, it can be hard to gather teachers together^[36].

The final challenge for principals is to change traditional thinking and leadership. From the traditional perspective, “principal is viewed as all-wise and all-competent by

the staff on the lower rungs of the power-structure ladder (and this kind of) omnicompetence (has been) internalized by principals and reinforced by others in the school”^[46]. Therefore, principals often consider themselves as the authority and have no need for professional development or have difficulty admitting the potential benefit of staff ideas that emanate from staff. In the long run, staff will not challenge principals even if they have different opinions. Thus, Kleine-Kracht^[47] proposed that principals should get rid of hierarchy and change into a learner. Moreover, in terms of leadership, although the role of the principal is essential to the success of the school, the traditional way of ‘one principal control’ is out of date in the current society^[48]. As mentioned before, to make more contributions, principals should distribute leadership across many units and actors^[49]. During this process, what principals should be spending their energy on is thinking about how to allocate leadership wisely, such as, how much leadership to allocate to whom and whether the allocation is reciprocal. For example, principals need to develop the ability to recognise the right strengths of people and use them in the right places^[48].

3. Application

3.1 Professional Learning Communities in the Chinese Context

Although most existing research on PLCs has been done in western settings^[6], PLC is not a new thing in Chinese schools, where teacher collaboration already has a long history^[50]. According to different scholars, in China, as an ‘umbrella concept’, PLCs compose different communities with different roles and meanings. For example, Qiao et al.’s extensive literature review^[4] summarised that PLCs in China come in three forms: informal learning groups, networked learning groups and teaching research groups (TRGs). Among them, informal learning groups are organised spontaneously by groups of teachers who are from different disciplines but with the same interests^[51]. They crossed the boundaries of organisations and formed groups to support each other and develop initiatives^[52]. Networked groups, as trans-school PLCs, are used to connect teachers from different schools and regions with internet tools or teacher-training programmes^[53] to share teaching materials and new ideas^[54]. The most widespread form of PLCs in China is TRGs (*jiaoyanzu*)^[55], and these have the most similarities with PLCs in western contexts^[56]. Teachers are required to do collective work, like joint class planning and collective class observations

in TRGs. However, PLCs within Chinese schools can be built in three ways: Teaching Research Groups, Lesson Preparation Groups (LPGs, *beikezu*), and Grade Groups (GGs, *nianjizu*). LPGs are teaching collaborative groups in which teachers carry out lesson preparation and study classroom teaching. Teachers in LPGs are from the same subject in the same grade in a school, while in TRGs they are from the same subject in a school, and “that is to say, each TRG is composed of various LPGs at different grade levels”^[57]. As the basic unit of school activity and grass-roots management organisation, GGs are made up of teachers from different subjects in the same grade in a school and are responsible for teaching and management^[58]. These forms of PLCs are pervasively rooted in the whole specific education system of Chinese schools, aiming to enhance students’ holistic development^[55]. It should be stressed here that, unlike PLCs in the west, such PLCs in China only include teachers instead of all professional staff^[59].

3.2 The Origin and Characteristics of Professional Learning Communities in Chinese Schools

Unlike PLC in western settings, PLC in Chinese schools is an administrative mandate for teachers^[57]. Which means that, as contrived communities^[50], PLCs are characterised by compulsion instead of spontaneity^[60]. Back in the 1950s, teachers were grouped in a top-down way^[61] and were authorised to conduct joint lesson planning and teaching inquiry. Later, the new curriculum reform emphasised the change from teacher-centered teaching mode to student-oriented learning to help students integrate their learning into their culture and life^[50]. Therefore, schools set up PLCs to meet this requirement of the Chinese Ministry of Education^[61]. Over the development of more than half a century, collaborative practice in PLCs have has institutionalised and deeply involved in the daily work of teachers^[57].

Cultural and educational background is significant to PLC practice^[15]. PLCs in China are formed and developed in “specific historical, institutional, and cultural contexts”^[19]. Therefore, in the research of PLCs in China, it is necessary to consider the Chinese specific social system and cultural background. There is a consensus among researchers^[41] that the characteristics of PLCs in Chinese schools can be concluded as “collaborative learning, professional competency, facilitative leadership, structural support, and organisational barriers”^[19]. The characteristics of PLCs analysed in the literature above and those of in China are compared in Table 1.

Table 1. Comparison of characteristics of PLCs

Characteristics	Hypothetical framework in literature	PLCs in China
Individual level	Shared values and vision Collective learning and application Reflective professional inquiry	Collaborative learning Professional competence
Organisational level	Shared and supportive leadership Supportive conditions ^[15]	Facilitative leadership Structural support Cultural barriers ^[19]

As illustrated in Table 1, there are some distinctive features of PLCs in Chinese schools. Through this comparison it can be seen that collective learning, application and reflective professional inquiry from literature are combined into collaborative learning in China. The shared vision disappeared, and new professional competence has emerged. The subscale of support conditions is divided into structural support and cultural barriers. Among them, the emergence of collaborative learning and professional competency is due to the collectivism in China. In the west, individualistic cultures and teacher isolation are the barriers for developing collaborative professional learning^[62]. Unlike the West, Chinese culture emphasises collectivism and Chinese teachers like to practice and learn together. Professional development activities have also been institutionalised into teachers’ daily practice^[50]. In teachers’ view, cooperation is a crucial opportunity to achieve professional competence development^[63]. Structural support is the product of the school education system in China, especially the Teaching Research System. According to the Ministry of Education, principals must fully support PLCs in schools, giving strong structural support and physical resources, like time and space^[64]. Finally, the establishment and maintenance of PLCs in China is hindered by its unique culture and values and this kind of cultural barrier is evident in schools^[65]. Firstly, Chinese traditional Confucian philosophy emphasises the harmonious relationship and respect for authority, so people attach great importance to harmonious interpersonal relationships in social activities^[66]. In terms of PLCs within schools, teachers try to maintain a harmonious relationship with their colleagues and principals to avoid conflicts^[67]. This may lead the PLC being only a superficial collaboration without in-depth and meaningful discussion, and teachers will not put forward different ideas or shortcomings of other teachers^[50]. “The obedience to administrative requirements may also result in a shallow adoption of reform policies”^[68]. In addition, teachers in the west seek to embrace different perspectives^[62]. Whereas Chinese teachers in PLCs tend to copy the ex-

perience of others. They try to find and identify the ‘best’ teaching practices and reproduce them in their classroom practices^[4]. Overall, PLCs in Chinese schools not only have the characteristics described in most western literature but also has some unique ones.

3.3 Developments of Professional Learning Communities

As above, 2,580 Chinese articles were obtained as the initial pool. In the following sections, these native articles will be included and excluded. Firstly, in order to ensure the quality of references, I only researched the database of excellent master and doctoral dissertations. Then, together with ‘urban’ as a keyword, I got 20 related sources. In the second screening I excluded articles that were conceptual or that did not site PLCs in specific environments. Articles based on flawed experiments were also excluded at this point. The final six sources were then selected. The following analysis is based on these six sources. The schools studied in these sources come from several cities across China, including 16 middle schools in Shanghai, 10 in Xinjiang, one each in Nanjing and Wuxi, and some represented by letters. Also, the level of these schools varies from the top middle schools in China to the bottom. To reduce the differences caused by different contexts, I picked those developments and challenges that occur most frequently.

Through comparison and analysis, the benefits of successful PLCs showed in these sources are largely the same. For students, the ultimate purpose of PLCs is to improve their academic performance. Therefore, it is obvious that successful PLCs can help students improve their learning^[69]. For teachers, there are three benefits. First, PLCs can establish common visions which can stimulate their sense of belonging and make them more energetic^[70]. Secondly, PLCs can improve teachers’ learning ability which includes the ability to cooperate in learning and solve complex problems, for the overall learning ability of teachers must be higher than the sum of individual learning ability. Moreover, inspired by cooperative learning and innovative spirit, teachers can easily overcome their inherent thinking patterns and cognitive patterns and can generate transcendent learning motivation in mutual communication^[70]. Finally, PLCs can also enable teachers to think and respond systematically. In the process of systematic thinking, teachers are encouraged to set up a holistic way of thinking, consider the overall situation in their actions, and eliminate differences^[58]. Overall, the benefits of successful PLCs in Chinese urban middle schools are also mainly reflected in the students and teachers and can further promote the level of schools.

3.4 Challenge for Principals

I have identified seven common challenges faced by principals in establishing or maintaining PLCs in Chinese urban middle schools. According to article 4 of the Professional Standards for Principals of Compulsory Schools^[71], principals are considered as the first person in charge of PLCs, so the first challenge for principals is how to choose the right content and form of PLCs^{[72][69][73][74]}. In many urban middle schools, the content of activities in PLCs is ultimately decided by principals. If they carry out these activities blindly, regardless of the actual situation of schools and the needs of teachers, like the actual difficulties in the teaching process. Then PLC activities will lack pertinence and purpose, resulting in low efficiency^[73]. In addition, if principals only use a single form of activities, such as group cooperation, teachers will lose enthusiasm^[74]. Four articles present this challenge, so it is a relatively common one. The second challenge, which appears in three sources, is how to make intelligent systems^{[58][73][69]}. Reasonable systems include proper evaluation, time, and resource allocation. Firstly, the quality of PLCs activities should be assessed by whether it promotes students’ performance. If principals’ evaluation of teachers is based solely on their research level or the number of their published papers, then the activities of PLCs will not achieve their original purpose^[73]. Additionally, teachers in urban middle schools are under high pressure and have limited free time. Therefore, if there is no reasonable time arrangement it will be difficult for teachers to participate in PLCs activities in accordance with the plan^[58]. Finally, in some schools, the distribution of resources will be unequal within PLCs. For example, senior teachers may have better programs and sponsorship than novice ones. This kind of inequality will cause novice teachers to lose enthusiasm to participate^[69]. The third common challenge is the requirement of principals to keep up to date with professional knowledge and quality improvement^{[72][69][70][58]}. This challenge also emerges four times. In China, principals play the charge role. However, due to the complexity of school management or their inability to realise deficiencies, their professional knowledge, understanding of the new curriculum and subject leadership may not keep up with the pace of teaching reform. This can lead to PLCs activities cannot be given reasonable guidance or evaluation by principals, and even lead to the loss of talent.

All the above are challenges that were found often in the sources, but this does not mean that the challenges found less frequently can be ignored. The less frequent challenges are as follows: Firstly, the proper distribution

of leadership responsibility^{[72][70]}. In China, most urban middle school principals insist on paternalistic leadership, leading teachers have less power to participate in decision-making or are easily not trusted. Therefore, their enthusiasm for PLCs is significantly reduced. On the contrary, if given too much power, PLCs may become an independent kingdom in urban middle schools. Another challenge is the reconciliation of contradictions among groups in PLCs, like TRG, LPGs and GGs^{[70][69]}. These are not opposing groups, but due to the intersection of participants, they can easily have contradictions and conflicts in time and content arrangement, leading to toxic competition and information gaps. In the long run, it will lead to low efficiency. In addition to reconciling conflicts among groups, principals also face the challenge of bridging gaps within groups^[58]. Although the policy for PLCs in middle schools is strict and cannot be changed at will, there is some flexibility in the management of PLCs by principals to make adjustments according to the context. For example, within the group, the teachers could be regrouped according to their length of service and age. These challenges occur once or twice in sources. Due to the unique cultural background, principals also need to face the challenge caused by the culture which has mentioned above. But this kind of challenges is tough to overcome.

4. Conclusion

This research aimed to explore PLCs' developments, and challenges faced by the principals in Chinese urban middle schools. To some extent, this research used narrative synthesis that relies primarily on the use of selected literature. Firstly, it introduced the theoretical knowledge of PLCs in schools from an international point, including PLCs' definition, characteristics and origin, and then analysed its developments, and challenges for principals in international middle schools. The developments can be reflected in the improvement of teachers and students, while principals face challenges from school culture, teachers, and traditional thinking and leadership. In the second part, the same themes were used to explore PLCs in Chinese schools. Developments of PLCs and seven challenges for principals were collected in a specific context of the Chinese urban middle schools.

Through comparison, it can be found that PLCs are thriving both in the international and Chinese educational contexts, with abundant and rising literature. However, it is worth noting that the concept of PLCs originated from the west, so it is difficult to find an exact counterpart in China^[69]. Most literature considers that PLCs in China is an 'umbrella concept' which includes GGs, LPGs and TRGs^[74], and TRGs is the closest to PLCs in the western

context^[56]. PLCs in China are mandatory and only include teachers^[59]. Due to the unique culture of China, PLCs in Chinese schools have their characteristics^[41]. For example, collectivist culture provides beneficial conditions for intensive teacher collaboration^[50]. But Confucian Makes teachers prefer harmony and try to avoid disputes, which lead to shallow adoption and superficial collaboration^[68].

In general, the developments of successful PLCs can be observed in both international and Chinese middle schools in terms of students and teachers. For students, it is mainly the improvement of academic performance^[75], and for teachers, it is the improvement of teaching practice and personal ability^[70]. However, according to my analysis, it seems that the improvement of teaching ability is more evident in western schools, while the improvement of Chinese teachers is more reflected in their personal abilities. The challenges for principals in Chinese and western schools are similar in that they both face the challenges of proper allocation of leadership, teacher resources and time, and professional development^[72]. However, as the first person in PLCs, principals in Chinese urban middle schools also need to design reasonable forms and contents for PLCs^[69] and adjust contradictions between and within groups to ensure the operation of PLCs in middle schools^[58].

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