# School-Based Professional Learning Communities as a Means for Curriculum Development: A Case Study from Taiwan

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# School-Based Professional Learning Communities as a Means for Curriculum Development: A Case Study from Taiwan

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| Article Info | Abstract |
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| | The purpose of this study is to explore how participating in professional learning communities influenced teachers' curriculum design skills during the recent curriculum reform in Taiwan. A cohort of high school teachers in suburban areas participated in a semester-long professional learning community, strictly based on a well-planned agenda as professional experimentation. The researchers adopted a qualitative method by devising an initial and a final interview protocol as a data collection instrument. The results identified four components during the PLC process leading to teacher change in the curriculum design process—active participation, consistent focus, supportive collaboration and collective learning and shared practice. The notions of hard and soft PLCs along with the implications are proposed. |

## Introduction

Professional learning communities (PLCs) have been viewed as a major facilitator in triggering teacher change (Tam, 2015) and have become a desirable approach for recent curriculum reform in Taiwan (Chen, Lee, Lin & Zhang, 2016). Change in teachers' beliefs and attitudes in PLCs are due to such factors as supportive leadership (French, 2017; Lee, Chang & Yin, 2011; Zhang & Pang, 2016), collegial trust (Betts, 2017; Cranston, 2011; Hord, 2009; Lee, Zhang & Yin, 2011, Wang & Ting, 2017), shared practice (Hord, 1997; Wong, 2010) and teacher autonomy (Webb, Vulliamy, Sarja, Hamalainen & Poikonen, 2009). Teachers' curriculum design skills or teaching practice could change via the practice of PLCs (Tam, 2015; Voogt, Pieters & Handelzalts, 2016). However, evidence shows that not many teachers embrace collaboration or change (Chen & Wang, 2015), and such resistance tends to be found in high school contexts more than elementary or middle school ones (Rucinski, 2017).

Although research regarding PLCs has been rooted and prevalent in Anglo-American, western settings (Chen & Mitchell, 2015; Chen & Wang, 2015; Hairon & Dimmock, 2012), increasing studies have been conducted to bridge the literature gap in Asia contexts over the past decade (Hairon & Dimmock, 2012; Hallinger, Piyaman & Viseshsiri, 2017; Pang & Wang, 2016). However, still more attention on PLCs was paid to the high-performing schools (Chen & Wang, 2015) or elementary school contexts (Hairon, Chua & Neo, 2018; Jiang 2014; Ting, 2014). Little is known about PLC implementation in suburban high school settings. Meanwhile, the definition of PLCs in Taiwan seems to be relatively broad and ambiguous (Chen, Lee, Lin & Zhang, 2016; Ting

& Chiang, 2020), and teachers might regard any seminars, workshops or even department meetings as PLCs. Research on planned PLCs with specific shared goals and solid agendas is valuable for understanding the nuance of teacher change in the PLC process.

All schools in Taiwan have been experiencing a drastic curriculum change due to the enactment of the new Curriculum Guidelines in August 2019. This change emphasizes teachers' autonomy in curriculum development. Teachers in the past have long relied on the textbooks approved by the National Institution for Compilation and Translation (NICT) under the Ministry of Education (MOE) Taiwan (Chou & Ching, 2012; Lu, 2017; Pan & Yu, 1999).

In this curriculum change, teachers have to know how to transform the core competencies from the *Curriculum Guidelines for 12-Year Basic Education* into a set of learning objectives in a course. Based on the learning objectives, teachers then develop effective rubrics or assessments to evaluate student learning performance. Three major competency dimensions: *autonomous action*, *interaction communication* and *social participation,* are viewed as the main axis to connect the grade level and learning subjects, and play the vital role in the integration of curriculum development (Chen & Huang, 2017; MOE, 2014).

To cope with the change, teachers in Taiwan were encouraged to work collectively in order to build up and expand their repertoire of teaching materials. However, some teachers did not visualize the need to make change (Chen, Fan, Guo & Kang, 2020). Those in rural or remote areas especially felt anxious because they did not know how to cope with the educational trend, as they were used to teaching to the textbooks and had very little experiences in developing their own curricula (Cho & Ching, 2012).

In order to help teachers cope with the curriculum reform, MOE Taiwan has taken several measures to empower teachers since 2017, including promoting pilot school projects, teachers' professional learning communities, instructional and curriculum consulting teams, curriculum consultant projects and so on (http://12basic.edu.tw). Teachers' professional learning communities have served as one of the important supporting measures for teachers in Taiwan to bridge the gap from the traditional curriculum practice to the new one (Chen, Fan, Guo & Kang, 2020). Since 2018, the MOE has regularly launched official seminars to train PLC leaders, hoping them to create positive momentum for teacher collaboration (Ting & Chiang, 2020).

The purpose of this study is to elaborate how teachers in under-resourced schools respond to the curriculum reform through the practice of professional learning communities. This qualitative case study is to probe observations of the curriculum planning practices and the experiences of a cohort of high school teachers from one suburban high school in Taiwan. Through a clear PLC purpose and planned agenda, each teacher was encouraged to design one individual elective, competency-based course to meet the needs of the new national curriculum change. To capture the nuance of teacher change during the curriculum reform, our main research question is: how does participating in professional learning communities influence high school teachers' skills in curriculum design?

## Theoretical Framework

This study aims to investigate teachers' participation and what they perceive about English curriculum design process through the practice of PLCs. The participating teachers took part in regular PLC meetings as an intervention to work collaboratively and to prepare for the new English curriculum, in which they implemented competencies derived from the newly-promulgated *Curriculum Guidelines of 12-Year Basic Education*. The study adopted Clarke and Hollingsworth's *Interconnected Model* (2002) to address teachers' professional growth in curriculum design skills and to especially elaborate *how* teachers made change through the mediating process of "reflection" and "enactment," as indicated in Figure 1.
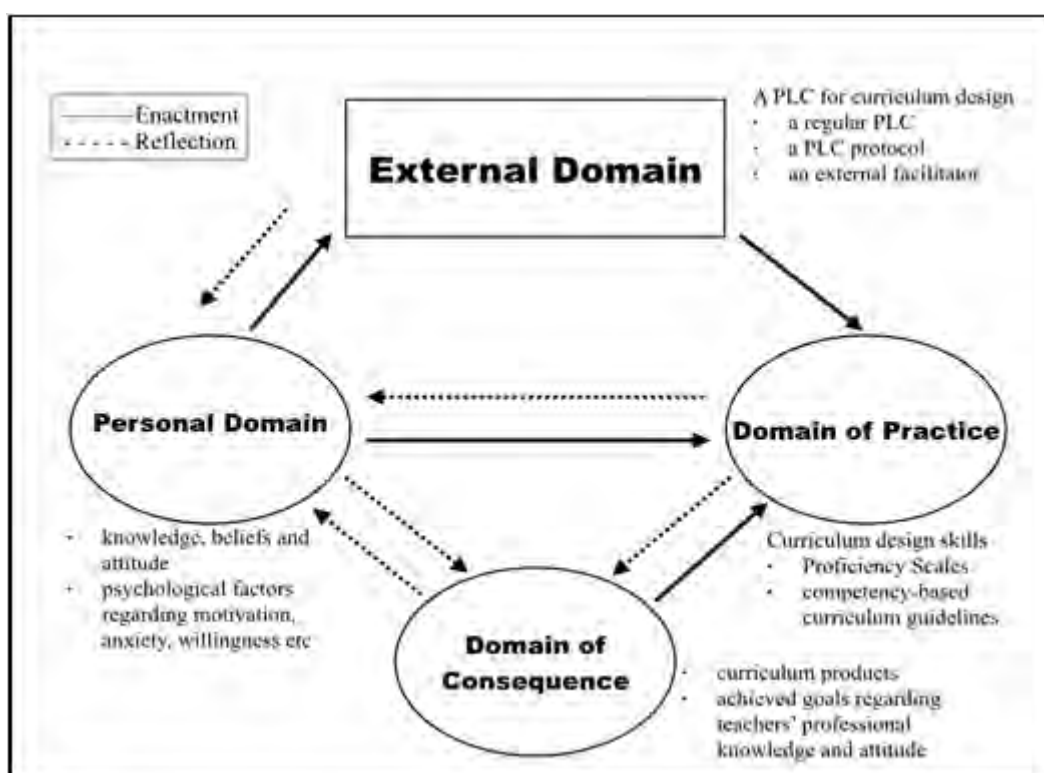


Figure 1. Theoretical Framework Adopted from the Interconnected Model of Professional Growth (Clark & Hollingsworth, 2002)

Clarke and Hollingsworth's *Interconnected Model* (2002) depicted the complexity of professional growth through four change domains—the external domain (external source of information or stimulus), the personal domain (teacher knowledge, believe and attitudes), the domain of practice (professional experimentation), and the domain of consequence (salient outcomes). In this qualitative study, the implementation and facilitation of the professional learning community was referred to as the *external domain*. In addition, teachers' knowledge, beliefs and attitudes about curriculum design, along with such psychological factors as motivation, willingness or anxiety were aligned with the *personal domain*. The teachers' practices in applying the curriculum design skills introduced in the PLC were viewed as the *domain of practice*. The curriculum design knowledge included Marzano's Proficiency Scale and the competency-based curriculum guidelines promulgated by Ministry of

Education in 2014 and 2018. The end products that the teacher participants created (the English curricula) and their achieved goals (enhance curriculum knowledge) were referred to as the *domain of consequence*.

This study aims to explore how teachers in suburban areas take advantage of the PLC to facilitate teacher change. The general research question is: *How does participating in professional learning communities influence high school teachers' skills in curriculum design*? Based on this framework, the research questions were elaborated more specifically as follows:

- How does participating in PLCs influence high school teachers' professional growth in terms of the personal domain?

- How does participating in PLCs influence high school teachers' professional growth in terms of the domain of practice?

- How does participating in PLCs influence high school teachers' professional growth in terms of the domain of consequence?

- What are the factors leading to teachers' professional growth in terms of the external domain such as PLC organization, implementation and facilitation?

## Professional Learning Communities

### Definition and Characteristics

Professional learning community (PLC) process has been seen as one of the effective ways to promote teacher collaboration and professional development (Servage, 2008; Chang & Wang, 2010). It refers to a group of teachers or school staff sharing and critically interrogating their instructional practice and student learning outcomes in a continuous, reflective, collaborative, learning-oriented, growth-promoting way to reduce teacher isolation and improve teacher collaboration (McLaughlin & Talbert, 2006; Stoll, Bolam, McMahon, Wallace & Thomace, 2006; Sun, 2010; Ting, 2012). Although teacher collaboration was never a new idea, the term "professional learning communities" became accessible by practitioner-theorists such as DuFour and Eaker (1998), gained widespread use throughout educational community and was widely recognized by teachers and administrators in the 1990s in the United States (Schlicter, 2015).

The idea of PLCs has evolved from two strands—from business sectors and from school and educational contexts (Hairon & Dimmock, 2012). From a business perspective, the idea of this term "learning community" could be traced back to Peter Senge's learning organizations in the1990s (Mitchell & Sackney, 2009), where Senge believes that people build shared vision, learn together to see the whole picture, and most importantly, develop team-learning through the practice of dialogues. In school and educational contexts, the practitioner-theorists DuFour and Eaker (1998) and researchers such as Hord (1997), Louis and Marks (1998) and Darling-Hammond (1998) focus on teachers' professional networking and efforts in the hope of supporting schools and improving student learning. Many related concepts and studies of PLCs have become prevalent since the1990s in the United States, and among the early PLC models, Hord (1997) presents a comprehensive definition of

PLCs by enumerating five core attributes of effective PLCs: supporting and shared leadership, collective creativity, shared values and vision, supportive conditions, and shared personal practice.

Teachers' PLCs are presented with different variations even in Anglo-American contexts. McLaughlin and Talbert (2006) identify three types of PLCs—weak communities, strong traditional communities and learning communities based on technical culture, professional norms and organizational policies. In a weak community, teachers feel isolated in terms of collegial relationship and are inclined to accept "prerogative of seniority," and believe that students might be passive in learning and differ in ability, whereas teachers in learning communities build strong collaborative networks, rotate courses and share workload, and believe that all students can succeed (McLaughlin & Talbert, 2006, p.19). Since the idea of PLCs has transformed from the Anglo-American system to Asian contexts, it might be hard to come to an exact definition of the term PLCs due to different educational policies and cultures (Chen, Lee, Lin & Zhang, 2016, Hairon, Goh, Chua, & Wang, 2017; Ting & Chiang, 2020). Generally speaking, teachers in Taiwan believe that any site-based teacher collaboration, teachers' meeting regarding pedagogical purposes, or cross-school seminars, or off-site workshops could be seen as teachers' professional learning communities. There is, therefore, a need to encapsulate the notion of PLCs to include different variations of learning communities (Saito, 2012).

**The PLC Initiatives in Taiwan and in other Asian Contexts**

Although the practice of professional learning communities has been recognized in the United States since 1990s, the notion of PLCs has been prevailing in Taiwan and some other east Asia contexts such as South Korea, Singapore and Japan in the late 2000s (Chang & Wang, 2010; Lee & Lee, 2013; Hairon & Dimmock, 2012; Saito; 2012; Ting & Chiang, 2020). For instance, Korean teachers, according to Korean appraisal and promotion policies, have to participate in professional development (PD) for 60 hours every year. Various types of PD have increased, such as online modules, long-term workshops and school-based activities (Kim & Lee, 2020). Among them, school-based PLCs have developed as a bottom-up force for teacher professional development in Korea (Lee & Kim, 2016). Apart from Korea, Singapore made PLC policy public in 2009 when Minister of Education and Director-General for Education identified PLCs as the means to improve teacher quality and professionalism and improved learning outcomes (Hairon & Dimmock, 2012; Hairon & Tan, 2017).

Particularly, Singapore has been the only country in the world to have a nationwide PLC model with clear use of the term and notion regarding PLC process (Hairon & Tan, 2017). The MOE Singapore provided extra funding and created an additional hour per week for teachers to participate in professional development; therefore, PLCs in Singapore, seen as one of professional development, were made mandatory (Hairon & Dimmock, 2012). Teachers' professional learning communities in Japan take their unique paths, as the forms of teacher-led professional development already existed in the 19th century (Saito, 2012). Lesson study, developed by Sato and his colleagues in late 1990s, serves as one type of profession learning community. It especially focuses on students' learning and motivation and teachers' collaborative efforts to enhance practice-based instruction and professional development. Besides lesson study, teachers in Japan have to renew their teaching certificates every

10 years through participating in 30-hour formal PD each year offered by universities or institutions (Kim & Lee, 2020; Saito, 2012).

Similar to many Asian countries, the introduction of PLCs in Taiwan was in late 2000s, accompanied by the implementation of the *Refining Teaching Program* and *Program on Teacher Professional Development and Evaluation* (Chang & Wang, 2010; Ting 2012). Meanwhile, MOE Taiwan in 2009 initiated PLC development and invested on a budget in the hope of promoting PLCs and increasing teacher collaboration. A brochure entitled *Professional Learning Communities for Elementary and Secondary Teachers* was also published to promote teachers' participation in PLCs. The number of teachers' professional learning communities increased from 626 to 828 in 2011 (Ting, 2014); yet a majority of PLCs were situated in elementary school contexts (Jiang 2014; Ting, 2014). In the infancy stage of PLC development, however, a majority of teachers still felt safer and more confident when working individually. Some initiatives were, therefore, offered by the MOE and the local government in order to encourage teachers to establish a collaborative culture.

However, PLCs in Taiwan have come across many obstacles due to a lack of time, budgets, motivation and qualified leaders (Hsu, 2017; Kao, 2008; Lin & Huang, 2014; Wu, Tsai & Wu, 2015). First, providing available, shared time is crucial to the onset of PLCs (Chuang, 2014). Many teachers in secondary schools are either homeroom teachers or administrators; hence, it is certainly an issue to squeeze a shared and common time for teachers to meet up (Hsu, 2017; Lin & Huang, 2014). Second, teachers' motivation plays a significant role in promoting PLC meetings. Many teachers have experienced psychological and physical stress in order to handle daily routines already, and PLCs that require a long-term practice sharing may result in extra burden for the teachers. This would lower their willingness to participate (Lin & Huang, 2014; Kao, 2008). Third, PLC budgets mainly come from the local governments through competitive projects, or through being sponsored by the parental clubs (Lin & Huang, 2014). Those limited budgets may not be able to support the PLC in a stable way. Finally, insufficient or disqualified PLC coaches or leaders may bring counter effects to the PLC practice (Hsu, 2017; Ling & Huang, 2014). Without appropriate PLC leaders, teachers who attend the PLC meetings might have paucity feedback, which may fail to meet the expectations for teachers' professional learning goals (Lin & Huang, 2014). Furthermore, if the PLC leaders or coaches do not understand the school culture in the first place, the authentic PLC process could be unlikely to take place (Kao, 2008).

**PLC Facilitation: Top-down, Bottom-up and Middle-out Implementation**

While Singapore adds budgets and makes PLC a requirement in teachers' professional development, and while Korean government also includes PLCs as part of teacher appraisal, PLCs in Taiwan seem to have a relatively flexible scheme. Unlike the "top-down command and control" educational system in Singapore (Hairon & Dimmock, 2012), teachers in Taiwan are encouraged to take part in PLCs with the support of extra funding and special arrangement of shared hours. Talbert (2009) indicated that teachers might experience compliance, resistance and anxiety if the PLC policy went top-down, which would very likely undermine mutual accountability among teachers. However, the benefit of the hierarchical top-down structure was to "ensure

strong, direct alignment between the stages of policy from conception to implementation" (Hairon & Tan, 2017, p. 97).

On the contrary, the bottom-up approach of PLC initiatives that Korean government has implemented provides voluntary energy for changing the school culture, and are believed to be authentic and sustainable (Ahn, 2017; Lee & Kim, 2016). More importantly, the value of bottom-up reform process turns teachers into the "reform agents" rather than "targets of a reform" (Ahn, 2017, p.91). Although the PLC could be more sustainable if initiatives go bottom-up, the challenges might be apparent that teachers do not visualize the need for working collaboratively, and sometimes PLC teams seem to miss the focus on student learning outcomes. Many have indicated that the themes of existing PLCs in Taiwan tend to cover teachers' interests and to ignore students' learning results (Ting, 2012; Ting & Chiang, 2020; Wu, Tsai & Wu, 2015).

There still exists another way of PLC initiatives that take place neither top-down nor bottom-up. The PLC initiative, occurring in-between and launched by teacher leaders, is called the "middle-out" approach (Mundry & Stiles, 2009, p. 57). This middle-out approach has good effects as it buffers the top-down bureaucratic pressure, and could also "avoid administrative turn-over that is typical in urban district" (Mundry & Stiles, 2019, p.70). This study was informed by the literature, and aimed to research into the role of a well-planned PLC with middle-out initiatives in a suburban high school.

**Teachers' Personal Factors to Participating in PLCs**

Successful PLCs cannot take place without making teachers feel secure or motivated. The focus on teachers' psychological level has recently played a vital role in relation to teachers' willingness in participation in PLCs (Geijsel, Sleegers, Stoel & Lruger, 2009; Prenger, Poortman & Handelzalts, 2021; Owen, 2016). Teachers' sense of self-efficacy, job satisfaction and commitment have been widely studied as the psychological factors related to teachers' professional learning communities in the past decades (Capara, Barbaranelli, Steca & Malone, 2006; Day & Gu, 2009; Hord, 1997; Goddard, Hoy & Hoy, 2000; Michaelowa, 2002; Mintzes, Marcum, Messerschmidt-Yates & Mark, 2013; Roffey, 2012; Zonobi, Rasekh & Tavakoli, 2017). It is important to note that teachers' psychological states are not the single cause-and-effect linear effect toward the success of PLCs, it could be influenced in a mutual way or in multi-causal ways. For instance, PLCs could greatly impact teachers' efficacy, which would lead to greater student achievement (Peterson, 2014), or with stronger self-efficacy, teachers tend to adopt changes successfully and be willing to take on problematic situations that generate stress (Bandura, 1995), and make the initiation of PLCs possible.

With the rise of positive psychology in the 2000s, many researchers have started to explore the relationship between teachers' positive psychological states and teachers' PLCs. Owen (2016) used a lens of positive psychology to understand what the key characteristics would be to foster a mature level of PLCs, and the results of her study indicate that through nurturing teachers' "positive emotions" and "sharing of good feelings" are the important keys (Owen, 2016, p. 417). Whenever teachers feel motivated and secure, or whenever they identify

themselves in more positive psychological states, the possible changes could be made through shaping their understandings, beliefs or mindsets toward participating in PLCs.

## Professional Learning Communities and Curriculum Design

Research has shown that teachers' collaborative team or professional learning communities are vehicles for attaining high quality curriculum (Hirsh, 2018; Voogt, Westborek, Handelzalts, Walraven, McKenny, Pieters & de Vries, 2011). Participating in a professional learning community focusing on curriculum design could help advance teachers' professional development and make contribution to the production of valid and feasible curriculum materials (Voogt et. al., 2011). Teachers actually need opportunities to engage in professional dialogues during the process of curriculum development. Collaboration practices such as teachers' professional learning communities "engage teachers as agents of curriculum decision making and their own professional learning" (Baildon & Damico, 2008, p. 1655).

Vescio, Ross and Adams (2008) suggest that the PLC model serves as a fundamental shift away from the traditional model of professional development, which tends to only look for teachers' "knowledge for practice" (p. 88). However, teachers collaborating in PLCs as co-designers of new curricula would lead to better curriculum development and teacher professional development (Voogt, Pieters & Handelzalts, 2016). There is an emergent need for high school teachers to work collaboratively in PLCs to support the upcoming curriculum reform in Taiwan, that is, to design school-based, competency-based curricula based on the *Curriculum Guidelines of 12-Year Basic Education*. During the PLC process, protocols are essential to the process and progression of PLC implementation (Browne, 2014), and PLCs also facilitate the "department's profession toward the school-based curriculum changes" (Browne, 2014, p. 123).

In many PLCs regarding curriculum design, the instrument of proficiency scales were implemented (Kosena, 2017; Stone, 2017). A proficiency scale defines various levels of knowledge in relation to a learning goal. It is viewed as a practical tool to enhance how teachers plan and to articulate essential content for assessments. Since assessments are intended to determine a students' level of knowledge, a proficiency scale could be used to create an assessment whose items very clearly match up with and indicate specific levels of proficiency (Marzano, Yanoski, Hoegh & Simms, 2013). Each scale includes three levels of content that represent the target learning goals (score 3.0), simpler learning goal (score 2.0), and a more complex learning goal (score 4.0). Once score 3.0—the target content—is set, the teachers work in PLCs create a simpler learning goal, score 2.0, by identifying knowledge or skills that are fundamental to the target learning goals. Proficiency scales serve as a useful tool for teachers to have a common language.

## Methodology

The purpose of the study is to explore what high school teachers' experience in developing competency-based curriculum and how participating in PLCs influence their professional grow and skills in curriculum design. A qualitative case study is utilized to obtain insights for interpreting how the English curriculum is constructed in

PLC meetings at a suburban high school in southern Taiwan during 2018-2019. A cohort of five English teachers taking part in the PLC process for a semester in order to develop their own elective courses was researched. A PLC protocol—theme, objective, proficiency scale, activity—conflating Wiggins and McTighe's *Backward Design* (2005), Marzano's *A Guaranteed and Viable Curriculum* (2003) and Lu's empirical curriculum design process in Taiwan (2017), served as an intervention in this qualitative study. The framework of this qualitative design is presented in Figure 2.



Figure 2. Framework of the Research Design

The PLC intervention is carefully designed by the researchers. One of the researchers served as the PLC leader, making sure that this PLC process strictly followed the PLC agenda adopted and modified from Venables (2011)—including *a small talk*, *review of group norm*, *review of last meeting*, *topic for this week*, *discussion*, *debrief* and *agenda for next week*. Each PLC meeting lasted 50 minutes. Each teacher signed the consent forms prior to the research. The researchers interviewed the each individual participant *before* and *after* the PLC process. The initial interview was to understand teachers' backgrounds and their past experiences prior to the PLC process, while the final interview aimed to respond to the research questions regarding how the participation in well-planned PLCs influenced their curriculum design skills. The initial interviews were about 45 to 75 minutes in length, and the final interviews, 49-72 minutes. Each interview was digitally-recorded and transcribed verbatim. The observations and conversations among participants were either written down or recorded during the PLCs. The PLC process was conducted mainly in English, and so were the one-on-one initial and final interviews with Teacher E. As for the other four local English teachers, the language used in interviews was basically in Chinese, and there were some code-switchings to English when specific terms such as Proficiency Scales were referred to.

The logic of data analysis was followed by a three-step approach suggested by Merriam and Tisdell (2015). Interview transcriptions were analyzed by both researchers from a totally inductive approach, to both inductive and deductive, and then to primarily deductive one. The categories that the researchers constructed met with

criteria: responding the research questions, being exhaustive, being mutually exclusive, being sensitive to the data and being conceptually congruent (Merriam & Tisdell, 2015, p. 213). Note that the data were collected by one main researcher, while during the data analysis process, three types of data were analyzed by both researchers: interview data, observation data and hand-writing notes as well as informal dialogues in online chat-rooms. Both researchers used MAXQDA version 18.2 to identify emerging themes, characteristics and descriptions. Similarities of the textural descriptions would be identified, coded and placed into categories to bring about the emerging themes. Participants' handwriting handouts and researchers' field notes were snapshotted and stored as different types of memos in the software. The written memos and non-formal professional dialogues in social network chatrooms served as the triangulation method and were also collected especially when teachers had questions during the PLC process.

**Background of the Case Study**

Bliss high school (pseudonym) is a suburban, public vocational high school in Southern Taiwan. There are 55 classes from Grade 10 to 12, including engineering, agricultural and commercial departments. Due to its geographical location and traffic inconvenience, Bliss high school is considered an under-resourced school as it received the same special budget reimbursement as those *remote* schools do (MOE Taiwan, 2019). A majority of students in this school are from the families of single-parent, grand-parenting, foreign-spouse moms or bereavement. Teachers in the initial interview expressed their concerns regarding dealing with students' low academic performance and behavior issues by saying that "Those students made me feel scared. …I had these feelings every single day that I was just unable to deal with them." Another teacher voiced that "sometimes they just cannot differentiate ABCs, what do you expect to teach them?" Besides challenges from the students, many teachers in Bliss high school used to work in isolation, viewed PLC meeting as an "add-on," and were requested to teach four to nine extra hours per week.

There are 12 tenure-track English teachers responsible for 55 classes. One American contract teacher affiliated to a MOE project joined the school in 2018. Five English teachers out of the 13 voluntarily participated in the school-based PLC in the hope of coping with the upcoming curriculum change. The age of participants ranges from 33 to 46, with 11 to 22 years of teaching experience, as shown in Table 1.

Table 1. The Background Information of the Participating Teachers in this Study

| Teacher | Pseudo name | Age | Gender | Years of Teaching |
|---------|-------------|-----|--------|-------------------|
| Teacher A | Amy | 39 | Female | 13 |
| Teacher B | Bella | 43 | Female | 19 |
| Teacher C | Cathy | 37 | Female | 11 |
| Teacher D | Debbie | 46 | Female | 22 |
| Teacher E | Eric | 33 | Male | 11 |

In Bliss high school, the PLC practice was not regular or mandatory. Among the four tenure teachers, Teacher B did not participate in the *Program on Teacher Professional Development and Evaluation*, a very common teacher development program in Taiwan, but was willing to participate in this PLC process; a further probe into her motivation was also made to understand the nuance of teacher participation. Interview questions for participants mainly focused on teacher change in terms of the PLC facilitation, personal participation, and curriculum design skills and strategies.

## Findings

Based on the four research questions, results were presented in accordance with the four change domains: personal domain, domain of practice, domain of consequence and the external domain as follows.

### Personal Domain: Active Participation

All the teachers voluntarily participated and actively engaged in this school-based PLC process. Teachers' sense of commitment made professional change possible. Different from one-shot or one-off workshops that took place in shared hours at Bliss High School and required teachers to attend, this PLC involved teachers' commitment and engagement. With a strong motivation and active participation, teachers were more willingly to share and learn. Meanwhile, teachers felt more committed for the PLC meetings while the inner motivation was boosted. Therefore, with active participation in the PLC, influence and change were made to enhance teachers' curriculum developing skills. As seen in Teacher Amy's (Head of the Department) example, she expressed how the participants were motivated toward the PLC process. She stated,

> *I think we joined this PLC because we wanted to take a part. Right? Everyone came voluntarily. We didn't push you and said, 'you have to come,' but the workshop-type PLCs held by school administration expected each teacher to be there. Actually not everyone attended the meetings in the end. I think the expectation is very different. This [PLC] is what I feel more willing to engage, but that isn't.* (A2/0524).

If forced to take part in PLCs, teachers tended to feel reluctant to make changes, and the positive influence made from PLCs would be rather limited. Teacher Debbie shared her belief that,

> *I think it is very hard to force teachers to do anything. So if you want them to have some output, you must have them engage in this voluntarily. Otherwise, all the efforts would be in vain and would exist only in name. I think.* (D2/0531)

For those teachers who prefer to continue working in isolation, a moderate interpersonal force might somehow counter-balance their resistance. Take Teacher Bella for example, she was the teacher who did not take part in professional development programs such as "Program on Teacher Professional Development and Evaluation;" However, with a certain degree of interpersonal relationship *quanxi*, she was willing to try and get involved in the PLC. The conversation between the PLC leader and Bella was revealed as follows.

*PLC leader: Actually even up till now I still feel curious about why you would be willing to join [in this PLC]?*

*Bella: I was thinking why you were inviting me (laughter). You should invite someone else.*

*PLC leader: So were you thinking about this seriously? Or?*

*Bella: Yes, yes. I was taking it seriously. I thought "Okay, since you invited me, I would just take a part."*

*PLC leader: So did you sense any interpersonal pressure about this?*

*Bella: Yeah, a little bit (laughter).*

*PLC leader: Thanks for being so honest (laughter)*

Teacher Bella, like many suburban teachers, used to teach twice as many hours as she should provide, and it was understandable that taking part in teachers' professional development would be regarded as another add-on task imposed on them. However, with a little friendly and interpersonal push, it would probably bring them beneficial experience toward professional development.

**Domain of Consequence: The PLC Protocol and Curriculum Design Product**

Based on the experiences on curriculum developing process, the five participate individually produced a 18-week curriculum implementing the PLC protocol: theme, objective, proficiency scale and activity. The salient outcomes in this PLC process were the curriculum outlines and 18-week lesson plans, classroom activities and materials. The curriculum design process started with the *desired outcomes* that the teachers expected their students to obtain after the course. Then, they considered incorporating the *core competencies* into the curriculum before they decided their *themes* for their elective course. In the next step, they developed the *proficiency scales*, where they set a smaller but precise target learning goal for Score 3.0 and 2.0 by unpacking the course objectives. In the final stage, they do the 18-week planning, including the lesson plans and materials. The curriculum design procedure was included in six steps: (1) desired learning outcome, (2) core competency, (3) theme, (4) course objective, (5) proficiency scale, and (6) classroom activity. Among the five participants, Debbie (Teacher D) was unable to finish her curriculum product because of too much workload and meanwhile, she expressed she might need more time working with the protocol: "I found I had a hard time catching up [the protocol], I think the pace in this PLC was too fast for me." (D2/0531)

**Domain of Practice: Collective Learning and Shared Practice in Curriculum Design Process**

The domain of practice refers to the teachers' trying new activities (Clarke & Hollingsworkth, 2002). Since the purpose of this PLC was for the participants to develop their own elective course, and a PLC protocol (theme, objective, proficiency scale and activity) was implemented and guided during the curriculum design process, the domain of practice in this paper showed how teachers applied the knowledge learnt to design their own curriculum. Since this research site was in a vocational high school, when developing elective courses, teachers may take students' vocational skills into consideration. Generally speaking, *collective learning* dealt with the

new knowledge or skills that the participants collectively learnt together, while *shared practice* occurred when teachers work together to plan, reflect and assess curriculum and instructional strategies in classroom observations. Note that the collaborative team had not yet had the chance to deliver this curriculum, *shared practice* in this case therefore focused more on the implementation of new curriculum-related knowledge obtained; that is, how the teachers put the knowledge of curriculum design skills into practice.

*Collective Learning*

Deciding themes was always difficult for teachers especially when teacher did not have the previous experiences. The conversation among the PLC coach as the PLC facilitator, Debbie, and Eric was displayed how they came up with their themes as seen in the observation records.

> *PLC facilitator: If you [Debbie] want to have your [own] curriculum, what would be that topic?*
> *Debbie: Um…currently ESP.*
> *PLC facilitator: English for Specific Purpose? Okay.*
> *Debbie: It depends on the department programs.*
> *PLC facilitator: If Debbie had a course in agricultural department and that should be something about the plants, right?*
> *Debbie: Gardening, farming, or agricultural design.*
> *Eric: That could get really overwhelming though as there are 18 to 20 classes, so how many different…*
> *Debbie: No, just one class [course].*
> *Eric: So even though they're technology students they're still learning agriculture?*
> *Debbie: No, this class would be open to agriculture departments only. This year I have a class of agriculture, so I would try to do something for these students, only these students. Maybe for the next three year, I would have other class, then I would work on other ESP (English for Specific Purpose). I won't do it all at once.* (Observation/0320)

Deciding themes was not an easy start to many participants, as some considered students' needs or their majors as well as their interests into consideration. In this conversation, Teacher Debbie gave her example in which she considered students' needs before she decided on her theme., which was a crucial start when implementing the PLC protocol. She was thinking of having a course for her students majoring in agriculture. Meanwhile, Teacher Eric was clarifying the point to figure out how he might do with his own choice. While exchanging ideas and making clarification, the participants gradually get to the point of how they could do to start with the course themes.

Another example of collective learning took place when the group was learning the proficiency scales and how to do corresponding formative assessments. Since some of the ideas were new to many teachers, they exchanged ideas about proficiency scales and the formative assessments in their fourth PLC meeting. The example regarding formative assessment was shown in the following:

> PLC facilitator: [Reading the handout] We can take a look on page 12. Walking around the classroom and observing the students interacting with the content, assigning a score that depicts the student's level of knowledge or skills regarding the specific topic observed. And we recored a score in our grade book for each student we observed. So this is the regular formative assessment, the informal formative assessment. Would anyone do this? I don't think I did this before.

> Bella: I don't think so.
>
> Eric: That's what I mostly do.
>
> PLC facilitator: You did this?
>
> Eric: Yeah, a lot, yeah. I'm probably more informal about it though. It's not kind of student A to me, you know [he was] 85. (laughters from all teachers)
>
> Debbie: Do they know you're assessing?
>
> Eric: No, they're more informal assessing, just more making sure like you're trying, and you're having idea, and you doing the work. I don't do it formally.
>
> Debbie: Do you give them a hint if you're not satisfied with their performance if they do not pay attention?
>
> Eric: Yeah, if they're not paying attention, I would tell them "you're not doing anything."
>
> Debbie: You told them directly?
>
> Eric: Yes, usually there are the types of students you have to tell them over and over and over again. It's always the same group, the same kid like …yeah. Most the kids were fine.
>
> Debbie: So you would frame up with them, you told them?
>
> Eric: Yeah. (Observation/0419)

The example manifested that when the new knowledge (formal assessment in proficiency scale implementation) was introduced, teachers exchanged ideas and deliberated about the information altogether. When developing proficiency scales, it was important to make them closely aligned to students' assessments. The above excerpt demonstrated how Teacher Eric used a formative assessment to check students' proficiency levels.

*Shared Practice*

In this qualitative case study, the participants learn how to incorporate *core competencies* and *proficiency scales* into their curriculum developing process. They worked together until the final product was created—namely, their own elective course curriculum. Through learning together, Teacher Eric indicated that he built his own curriculum along the way with the group in the PLC process. He shared his experience that,

> So it seemed like we were just gradually working through the goals of the PLCs, moving from what do we try to accomplish and moving on to targeting goals, moving on proficiency scales. We were gradually building our curriculum. (E2/0525)

This PLC in particular provided many hands-on learning tasks for the participants to work together, especially the process of collective learning in acquiring the knowledge of core competencies and proficiency scales. Teacher Amy specified her experiences in creating her proficiency scale. She noted that,

> *After the theme was decided, you had to write Score 2.0, 3.0 and 4.0 from the big [course] objectives that we had discussed together. Then I had to create the target learning goals. I think I had never had any experience to think about this [creating a proficiency scale].* (A2/0524)

Teacher Cathy benefited from the collective learning process in which she spent a great amount of time studying how to write the proficiency scales. She shared her example of the proficiency scales with other participants in the fourth PLC meeting, which elicited positive feedback and professional dialogues. Cathy firmly believed that through doing these assignments and sharing, she acquired the curriculum design skills. She said,

> *I acquired the ability and skills through the process. These skills were mine.* (C2/0530)

With this school-based PLC, teachers became the change agents. They changed the way of how they set goals and how they see students. For instance, through shared practice, Teacher Amy acquired the skills of how to set clearer learning objectives. She uttered,

> *It [This PLC process] makes us [teachers] more focused on the learning objectives. Otherwise, I will be more focused on making students happy (laughters), as I am afraid that English bores them. I might miss the target of learning just to have them feel happy about learning. But with the help [of this PLCs], I would be more focused on the learning objectives.* (A2/0524)

In addition, Teacher Cathy complemented that her change toward curriculum design skills was how to set up concrete and appropriate learning objectives in particular. She said,

> *I think [during the PLC process] I learned the modus operandi, especially in developing objectives. How to establish the objectives is so much helpful to me in terms of teaching or in other some other aspects.* (C2/0530)

Teacher Eric also shared his opinion that through the PLC process, he believed his skills of curriculum design were enhanced by keeping his curriculum more organized and more focused on the objectives. Also, he tried to make sure the different parts of the curriculum were in line with each other under an organized framework. He mentioned,

> *Definitely more focused and organized. Yeah. No question. …You know, like before I start planning the lessons in detail, just making sure I've got the goals, targets, and the competencies all align with each other and set before I start to make a lesson or make an assignment. Yeah, I have a more clear idea of whether or not everything is in line.* (E2/0525)

**External Domain: Consistent Focus and Supportive Collaboration**

*Consistent Focus*

Another sub-theme regarding how teachers' PLC participation influenced their skills in curriculum design referred to *a clear and consistent focus* that took place in the PLC process. Unlike the other one-shot PLCs or one-shot lecturers whose topics were very broad, this PLC shifted the focus from a broad spectrum to a clear, organized target of curriculum design. Teacher Eric indicated that,

> *This one [PLC] is definitely more focused on our syllabuses and curriculum, and it's very targeted like I have a concrete idea of what will we try to finish, but the other meeting themes were more broad, maybe they gave out ideas for things we could be doing in class, or taking a look at, just a general trend at education.* (E2/0525)

It was apparent that teachers taking part in this school-based PLC featuring a consistent focus had obtained new knowledge and discovered positive influence on their curriculum design skills. Teacher Amy specified this kind of PLC from other school-based PLCs by saying,

> *However, if PLC were held by the school administrators, I think it was difficult to do this [making consists focus on PLCs]. Yes, because it [the PLC topic] was dealt with once, once, once, and each time [we learned] was just only a point, a point, a point, and a point. Yeah, there was a pretty huge difference. Yeah.* (A2/0524)

What's more, without giving the school-based PLCs a consistent focus, Bliss High School was said to yield unsatisfactory result in the School Evaluation report. Teacher Cathy pointed out that,

> *This [without a consistent focus for PLC process] was viewed as a weakness in our School Evaluation last time. While they [committee members] were checking our PLC reports and records, they found no consistency. All we have was a single topic [for PLCs] one after another. ...Then those PLCs would have different topics or themes, and the focus kept changing. Then you figured out that before you could think about the topic carefully and make some changes, you were asked to jump to the next topic. It was like...you could never ever achieve anything. And you later found that you went back to the traditional way of teaching, as it was the safest way to do so. Yeah, so I think, when you got back to the old track, there was no way to make any changes.* (C2/0530)

*Supportive Collaboration*

In this school-based PLC, trust and positive relationships were gradually built through setting up *a group norm* and *the practice of small talk*. In the first meeting, all the participants were invited to form a group norm, which was a totally new experience to all the participants.

*Group Norms.* Mutual trust and openness were ensured through forming a group norm in the very first PLC meeting. The participating teachers agreed to make five points in the group norm, as they put it, (1) be punctual, (2) be prepared, (3) be relaxed, (4) be encouraging and supportive, and (5) be practical. Group norms are guiding principles that help validate the purpose of the PLC team and provide a reminder of how team members have agreed to work with on another. Two excerpts were displayed below to understand how the participants thought about the group norm.

> *I think the norm enables us to understand the meaning of why participating in this PLC and what attitude we should bring to the meetings. I think it's also very important. Although I thought it was not that necessary in the beginning, I figured out later that it was made greatly necessary, as it was beneficial, very beneficial, and there was a need to do so.* (C2/0530)

> *I think we were forming a consensus. We need to know what is going on, so I think it was a good move to form a consensus.* (D2/0531)

Forming a group norm kicked the PLC collaboration off to a good start. It helped the group members understand what principles or attitude they should bring to the PLC meetings. Through their agreement and consensus to the group norm, they gradually build collegial trust among one another, as they knew the expectations and the principles of the PLC.

*Small Talk.* The purpose of the small talk was to build collegial trust through a warm-up activity. In the PLC meetings, each participant was engaged in a small talk before they moved on to the next session. The small talk, taking up 5 minutes prior to the discussion, served as an ice breaker, hoping participants to speak up and share their personal story or opinion. The purpose of small talk was to build trust among the participants.

Some teachers might think in the beginning that the small talks seemed to be redundant and could be skipped or removed from the PLC agenda because the PLC members were coworkers for years. However, working together for a long time did not necessarily mean that they truly *knew* each other. Teacher Amy suggested that:

*I do want to skip it [the small talk], and I think it is not that necessary. Why do we have to talk about this? I just don't wanna talk about it, and… this is my first thought. However, after I finished my small talk, I always felt pretty happy (laughters).* (A2/0524)

As described, the implementation of small talks was viewed as unnecessary in the PLC agenda at first; however, small talks later received high recognition in teachers' PLC experiences. Hence, the practice of small talk helped each other share something personal and related to their daily lives. Teacher Cathy uttered,

*I pretty enjoyed the small talks in the beginning. This [small talk] I think it was great…. It took just about five minutes for everyone to warm up, so it was easier to move on to the next. I think we do know each other for a long time, but small talks were to know each other in a more detailed way in our lives.* (C2/0530)

*Collaboration Comes From Supportive Relationships.* Developing mutual trust and positive relationships is a process toward building supportive collaboration. It helps teachers gain mutual respect and put aside individual differences so as to give and take the constructive advices. Teacher Debbie gave an elaborated description about how she recognized some other participants' strengths during the practice of this school-based PLC.

> *Peer recognition is something that I just said about the influence [of the PLC]. And I can see some other peoples' strengths. We could collaborate in the future after I know their highlights. Without this PLC, I don't even know Bella likes teaching English songs. ...And during this [PLC] process I figure it out that each teacher actually has many competences. I now know that she is so good at this and that, so later I could go ask her or some other colleagues for suggestion or advice. I think this is pretty important.* (D2/0531)

Thanks to the culture of supportive collaboration, the participants felt free to share their ideas and to engage in professional discussion, and they were more willing to take risks. Teacher Amy believed that the support and assistance were the most significant benefits in PLCs. Because of the supportive collaboration, Teacher Belle voiced that "*I would  be more willing to add more varieties to my teaching.*"

*Benefits from External PLC Facilitators.* Teacher Cathy affirmed that the process of learning proficiency scales in the PLC really made a significant change both to her curriculum design skills and to her teaching. The knowledge building process of proficiency scales took place not only in PLC meetings, but also in one-on-one coaching with the help from the PLC coach. Cathy stated that,

> *I would go discuss with you directly before our scheduled time, so this process [of acquiring new knowledge] is important to me. Because sometimes in the 60-minute meeting I was not able to…, I could not think of any questions yet. I always had questions while I was doing it, then I really needed a consultant. I needed consulting. Therefore I think it was a must to do the one-on-one coaching. ...Because we might not have enough time to cover many details in the 60-minute meetings. I could take advantage of the one-one-one section to ask my inquiries.* (C2/0530)

Teacher Cathy pointed out that there was a need to have a discussion with the PLC coach to clarify some points during the curriculum developing process. She highly recognized the benefits gained from the discussion with the PLC facilitator, as she set extra meeting hour with the coach prior to the fourth PLC meetings.

## Discussion

### Active Participation as the Distinct Key to Success of PLC Process

The component of teachers' *voluntary will* plays one of the most significant keys to effective collaboration (Prenger, Poortman & Hanselzalts, 2021). The participants believed that the PLC that they participated in was different from those administrative-prompt PLCs, and the reason why they worked collectively to be productive was due to their motivation. Sustaining teachers' motivation, commitment and enjoyment of their work was also

as important as improving student learning outcomes (Webb, Vulliamy, Sarja, Hamalainen, & Poikonen, 2009). More specifically, with strong and positive elements in personal domain, teachers gained knowledge and skills and their professional attitude also changed (Prenger et al, 2021). The research findings also pointed out that there might be resistance to teacher change if the PLCs were only made mandatory or top-down. If PLCs were made mandatory (Hairon & Dimmock, 2012; Hairon & Tan, 2017) or tied to the teacher appraisal (Webb et. al., 2009), the government or the authoritative had to deal with teachers resistance or to find other ways to lessen their job anxieties.

Although teachers in Taiwan enjoyed a certain degree of flexibility in choosing their professional development alternatives (Chen & Wang, 2015), many schools in Taiwan have developed stronger forces for teachers to take part in PLCs, especially when the new curriculum reform hit the road. The paper proposed one possible solution to deal with teacher resistance. For those resistance-prone teachers, the interpersonal *quanxi* from *teacher leaders* might take certain effect in Asia contexts, especially in southern Taiwan where interpersonal relationship *quanxi* was a crucial determiner in developing social networks. Interpersonal *quanxi* creates a pulling force, slightly and gradually moving the resistant teachers out of their comfort zone (Wong, 2010).

**Consistent Focus in PLC Process**

Having a consistent focus is another highlight that the participants kept articulating. Actually, the nature of PLCs should be *focus-oriented—*focus on student learning results (Cassity, 2016; DuFour, 2004; Louis & Marks, 1998; Reeves, Pun & Chung; 2017; Owen, 2016; Ting, 2012) focus on instructions (van Es, 2012; Prytula & Weiman, 2012; Wang, Wang, Li & Li, 2017) or focus on curriculum development (Chen, Wang & Neo, 2015; Hairon, Chua & Neo, 2018). The focus of the PLC, in this case, was on the curriculum design process.

In this study, the idea of *hard PLC* was proposed to indicate that the development of PLC in Taiwan should be evolving from PLC 1.0 toward PLC 2.0. The participants argued that those single-shot conferences were not real PLCs because the focus of those meetings were not consistent. Therefore, the *hard PLCs* should emphasize the attitudinal level—that is, the the activeness (Burke, Berry & Marx, 2011).

*Group Norms and Small Talks as Catalyst for Supportive Relationships*

Similar to the previous research (Marzano, Heflebower, Hoeh, Warrick & Grift, 2016), the group norms and small talks serve as catalysts for supportive relationships. During the whole PLC process, the PLC coach invited all participants to establish a group norm. "Group norms are the guiding principles by which a collaborative team governors itself and its work. Norms help validate the purposes of the team and provide a reminder of how team members have agreed to work with one another" (Marzano et al., 2016, p. 23). With the group norm established in the first meeting, the participates formed a consensus and understood every member's expectation toward the PLC process. Apart from group norms, small talks helped build collegial trust. Marzano and his team suggested that "one simple tactic for building trust and good relationship between team members is for each

person to share some detail about him-or herself. When colleagues know each other as people, rather than just as coworkers, they are more inclined to trust each other" (Marzano et al., 2016, p. 26). When teacher trust each other, they can collaborate more effectively (Marzano et. al., 2016).

**Teacher Change through Collective Learning and Shared Practice with the help of PLC Facilitators or Coaches**

The result indicated that *teacher change* took place through collective learning and shared practice with the help of PLC facilitators or coaches. In the *Interconnected Model of Professional Growth*, the salient outcome referred to teachers' change in their existing knowledge and belief (Clarke & Hollingsworth, 2002). In this case study, all participants recognized their positive change toward their curriculum design skills. They specified in particular that there were changes made toward setting concrete objectives and creating proficiency scales to a certain extent. Stimuli and support provided in the external domain were crucial in directing the learning path of teachers (Clarke & Hollingsworth, 2002; Voogt et al., 2011).

Similar to the In Voogt and his research team's empirical study, *an external facilitator*, who aimed to guide teacher learning in Teacher Design Teams (TDTs) played a crucial role in providing stimuli and support, and in preventing negative results of professional learning in teams (Voogt et at., 2011, p. 1243). In this current study, one of the researchers served as the facilitator and PLC coach, provided the PLC agenda and also offered support to ensure that PLC process was both directed in aligned with the protocol and facilitated with positive learning atmosphere. During the process, teachers sensed the stimuli or pressure from the external domain (i.e., the enactment of new curriculum), they voluntarily participated in the PLC process as a mean to deal with the stress or curriculum change. With the aid provided from the PLC coach or facilitator, they went through the PLC process and completed their own products. The research findings corresponded to Clark and Hollingsworth's (2002) the *Interconnected Model of Professional Growth*, and also echoed Voogt and his colleagues' research (2011) where the external facilitator played a significant role in curriculum design process.

In the study, with ambiguous definition around PLC (Chen, Lee, Lin & Zhang, 2016), there is a need to differentiate *passive, non-consistently focused* PLCs from *active, consistently focused* PLCs in Taiwan. The researchers therefore propose the idea of *hard PLCs*—referring to a PLC process with active participation, supportive collaboration, consistent focus and collective learning. *Hard PLCs* emphasize teachers' *active and engagement*, which plays a crucial role in initiating PLC dynamics, as Durksen, Klassen and Daniels (2017) suggested teacher engagement would have a positive correlation with teachers' professional learning teams. Therefore, being *active* was an immensely important element in *hard PLCs* (Durksen et al., 2017; Owen, 2016).

Figure 3 exhibits the spectrum of hard PLCs and soft PLCs. *Hard PLCs* are characterized with high and active participation, consistent focus, supportive collaboration and collective learning. Also, *hard PLCs* include specific participants with well-organized group norms that are facilitated by PLC leaders. It confirms with the previous studies (Tam, 2015) that PLCs would be successfully practiced with the creation of a new structure. On the other hand, *soft PLCs* are loosely organized and very likely open to all. They could be arranged as single-

shot lectures or policy announcement. Teachers in *soft PLCs* have relatively limited engagement, and the attendance rate might be one of the very few factors to verify the effectiveness of this type of PLCs.
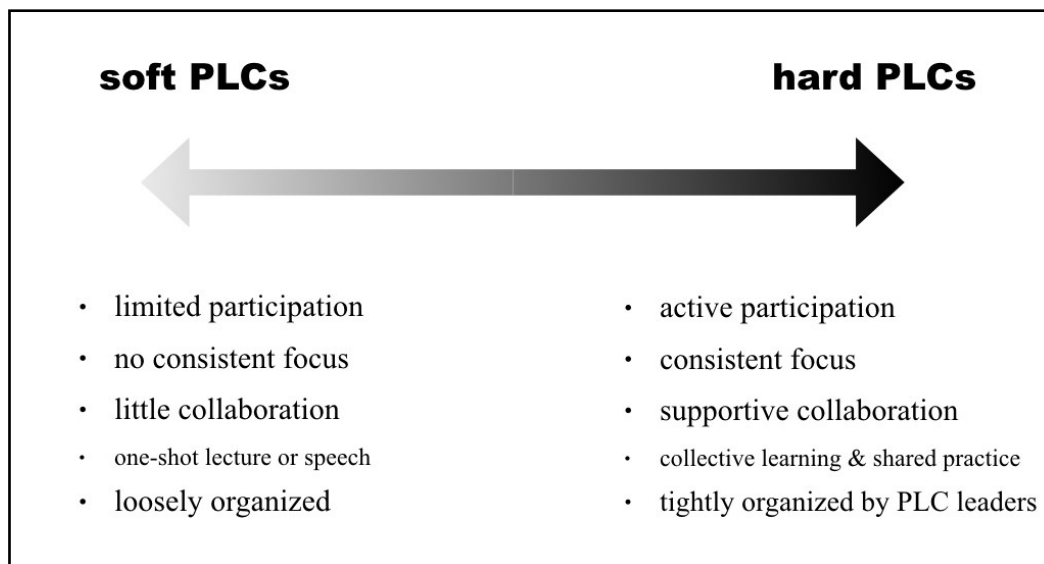


Figure 3. The Spectrum of Hard PLCs and soft PLCs

## Conclusion

This qualitative case study investigated teacher curriculum development through their participation in a school-based professional learning community in Taiwan. This paper indicates that teachers' curriculum design skills have been enhanced through a well-planned PLC. During the semester-long process, the participants formed a group norm, shared personal stories in small talks, built trust by respecting different opinions, gave and received advice, and made authentic collective learning take place. Meanwhile, during the one-on-one discussion session with the PLC leader, each participant brought up their questions or difficulties derived from the curriculum developing process. The coaching experience was highly recognized by the participants. The idea of *hard PLCs* was proposed to indicate a PLC implementation with active participation, consistent focus, supportive collaboration and collective learning and shared practice.

The research findings have important implications for in-service training and professional development. First, a middle-out approach serves a significant initiative to form a PLC process. The role and skills of PLC leaders are crucial for implementing successful PLCs, especially in the suburban areas. Without top-down, bureaucratic pressure, teachers tend to have stronger motivation and are more likely to take part in the PLCs. It is suggested that the PLC leader workshops be promoted to cultivate more qualified PLC leaders. Second, PLCs with a well-developed protocol and planned agenda ensure consist focus and promote collective learning and shared practice. A neat-planned agenda inviting teachers to have small talks and to form group norms is one of the keys to building trust and inducing collaborative culture. Future research could be conducted to examine more *hard PLC* cases and to explore whether hard PLC attributes promote better effectiveness.

## Limitations

There are several limitations existing in the study. First of all, the sample of the research includes only five participating teachers in suburban areas. Since each participant's individual experience is unique, the results of the research could not be generalized to a broader teacher population. Nor could the results represent the views of the overall suburban teachers. Second, the participants are voluntarily taking part in the research; therefore, the outcomes of the study may be assumed to have a more positive leaning to a certain extent. Third, the role of the researcher is an observer as participant (Merriam & Tisdell, 2015) in order to elicit richer and deeper perspectives from the participants. However, the researcher's multiple roles of an observer, a PLC facilitator, and one of the researchers should be taken into consideration.

## Implications for the Future Research

First, as many empirical studies in Anglo-American settings have indicated the significant and influential role of "external facilitators" in guiding and supporting the curriculum design teams or professional learning networks (Prenger et. al, 2021; Voogt et. al, 2011; Voogt et. al, 2016), the implementation of external PLC facilitators in the case study also supported its positive outcome. Future research could be done in different Asian contexts and have PLC facilitators serve as coordinators to provide suggestions for instruction, or coaching for professional practice and growth. In addition, the future studies are suggested to limit researcher's role as an observer to confirm all interpretations and enhance objectivity and validity. Last but not least, a control group with the same PLC intervention is suggested in order to provide comparison to the research.

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