Exploring Teacher Collaborative Change: Professional Learning Networks in Taiwan

Introduction

Teachers' competence, care, and commitment are vital for student learning (Hargreaves, 1995; Hord, 2007). Collaborative professional learning communities (PLCs) enhance teachers' capacities, promote professional development, and improve student outcomes (DuFour & Eaker, 1998; Hord, 2009). This reduces isolation, promotes growth, and fosters collaboration within professional learning communities (McLaughlin & Talbert, 2006).

PLCs have been adopted in Asian countries like Singapore and South Korea to strengthen teacher professionalism (Lee & Kim, 2016; Lee & Lee, 2013; Hairon & Dimmock, 2012). Taiwan introduced on-site PLCs in 2009, but the COVID-19 pandemic shifted collaboration to virtual spaces (Chuang & Ting, 2021). Distance learning and school closure have turned face-to-face on-site PLCs into virtual spaces, and "new, virtual forms of professional collaboration" emerged (Hargreaves, 2021, p. 1838). Teachers adapted to online platforms, expanding collaboration beyond school boundaries (Carpenter, Krutka & Trust, 2022; Prenger, Poortman & Handelzalts, 2021). Professional learning networks (PLNs) emerged as virtual forms of collaboration, allowing teachers to learn and share across schools (Brown & Poortman, 2018; Jackson & Temperley, 2009).

Most studies regarding PLNs focus on European or English-speaking school systems (Brown & Poortman, 2019). Only three relevant studies have been documented in Taiwan, including one in a medical college and two in K-12 educational contexts (Chen & Chien, 2015; Chen, 2015; Young & Fu, 2021). However, it remains unclear how professional learning networks are initially implemented and organized and how the leaders lead teachers to

collaborate virtually in cross-school settings. This study investigates six PLNs in Taiwan, aiming to contribute empirical research to the existing literature by providing insights into their implementation, organization, and unique Asian cultural context.

Theoretical Framework

To investigate how a network is created and formed, this study adopted Hadfield and Chapman's (2009) *design flow of a network* as the theoretical framework as shown in Figure 1. Hadfield and Chapman (2009) argue that all networks share four common features: purpose, agency, process, and structure.

(Figure 1)

Hadfield and Chapman (2009) propose a framework for implementing professional learning networks (PLNs). The first step is establishing a purpose that brings teachers together, giving them a sense of identity and belongingness. The second step involves balancing collective learning and action within the network. Some teachers focus on individual learning and empowerment, while others work collectively towards specific goals. The process of the network includes trust-building and professional interactions, with coordination processes establishing the network and generative processes developing new skills. The structure of the PLN can take various forms, such as hub and spoke, nodal, or crystalline networks as shown in Figure 2. Internal drivers, including network organizers, prior connections, and collaborative efforts, shape the network's structure.

(Figure 2)

Research Questions

This study aims to investigate how teachers in Taiwan use professional learning networks to address educational change and examine the initial implementation of PLNs. Based on the theoretical framework, four research questions are presented.

RQ1: What is the purpose and motivation of teachers joining professional learning networks?

RQ2: What processes are involved in forming professional learning networks?

RQ3: What have been the key outcomes and gains of professional learning communities, collectively and individually?

RQ4: What are some issues which have emerged in the formation and implementation of professional learning networks?

Literature Review

Professional Learning Networks

Professional learning networks (PLNs) are groups of teachers who collaborate to enhance teaching effectiveness and improve education quality. They engage in professional learning, share ideas and resources, and exchange feedback and solutions beyond their immediate community (Brown & Poortman, 2018, Trust, 2012). PLNs can involve various stakeholders and serve as platforms to improve instructional practices, examine curriculum objectives, and share professional practices (Brown, 2019; Hubers, 2016; Stoll, 2010, Trust & Prestidge, 2021). The primary focus of PLNs, like professional learning communities, is to enhance the teaching and learning process (Brown & Poortman, 2018).

Shift from PLC to PLN

The implementation of learning networks also promotes cross-school, interdisciplinary teacher collaboration (Hadfield & Chapman, 2009). Evidence shows a transition in teacher professional development from PLCs to PLNs, with individuals seeking collaboration and support beyond their communities. PLNs offer flexibility and utilize technology, unlike face-to-face workshops and seminars (Prenger et al. 2021; Trust & Prestridge, 2021). With the common use of social media, PLCs have been brought outside the school premises and PLNs have become a new trend for educators and stakeholders (Prenger et al., 2021; Trust & Prestridge, 2021). Taiwan, despite its small size, shows a noticeable development gap between rural and urban areas. PLN serves as a crucial platform for teachers to bridge educational inequalities, providing equal access to educational opportunities.

Advantages and disadvantages of PLNs

PLNs provide convenience with flexible time and space, allowing access to virtual spaces (Trust & Prestridge, 2021). Cross-school networking involves diverse participants, welcoming more voices and perspectives (Brown & Poortman, 2018). The implementation of a PLN can lead to knowledge mobilization, ultimately yielding positive effects on student outcomes (Manson, 2021). PLNs promote knowledge sharing, support teachers' dedication, and facilitate the sharing of innovative instructions and peer recognition (Kruta et al, 2017; Young & Fu, 2021; Prenger et al, 2021). Additionally, there is no single right way to learn in a PLN, allowing participants to develop their unique PLN style (Young & Fu, 2021; Prenger et al., 2021).

PLNs have limitations, such as participants feeling isolated without physical interactions and facing difficulties in establishing shared goals due to diverse backgrounds (Trust, Krutka & Carpenter, 2016). Implementation can be complicated, leading to

fragmentation and reduced effectiveness (Lai & McNaughton, 2018; Prenger, Poortman & Handelzalts, 2021). Managing large PLNs becomes challenging, and they can consume significant time away from teaching. These factors increase costs and may become an additional burden alongside daily school practices (Lai & McNaughton, 2018).

Methodology

This study used Hadfield and Chapman's (2009) “The design flow of a network" framework as its theoretical foundation. Eight interview questions were developed based on the four-step framework: purpose, agency, processes, and structure. The questions were refined by the researchers, then reviewed and modified by three external experts, including two professors and a principal, to ensure the validity of the interview protocol.

Context and Participants

In March 2022, the Ministry of Education Taiwan launched the RAS project, a professional learning network initiative, featuring “reflection, action, and share.” This project involves 20 Professional Learning Networks and over 500 participants from all cities across Taiwan.

To understand teachers' motivations for joining PLNs and their views on effective PLNs through interactive discussions, the researchers chose six PLN leaders from different education levels to form the focus group as shown in Table 1. The initial interviewee was recommended by the principal investigator (PI) of the project, and the remaining five participants were recruited through snowball sampling techniques.

(Table 1)

Data Collection

All six PLN leaders received email invitations detailing the research purpose, methods, and questions. With the consent forms, a recorded focus group session was scheduled via Google Meet. The 2-hour focus group interview aimed to gather the participants' insights on the purpose, agency, process, and structure of their PLN. The verbatim transcriptions were sent to each participant for respondent check, with an accuracy rate of over 95%.

Data Analysis

The Chinese data were translated into English to enhance the accessibility of the study's findings. The qualitative data analysis software, MAXQDA, was used for analyzing the collected data. The audio recording was transcribed by a research assistant and imported into MAXQDA. The data were then coded and categorized by three researchers to identify recurring concepts and patterns as “investigator triangulation occurs when there are multiple investigators collecting and analyzing data” (Merriam & Tisdell, 2016, p.245). Comprehensive findings were identified through a thorough exploration and interpretation of the data

Findings

Four themes regarding the initiation of PLNs emerged as follows.

Support from a coordinating college is the driving factor for initiating the PLNs, along with leaders’ passion, and need for collaboration. Through interviews with the PLN leaders, the study identified support from coordinating colleges, educational needs, and passion for sharing and practice as the three driving factors initiating the PLNs. The crucial role of the coordinating college in providing leadership training and logistical support was evident, empowering leaders to take on the PLN mission.The urgency to cope with educational changes led to the initiation of PLNs, fostering collaboration and knowledge exchange among

teachers. Teacher leaders, driven by a commitment to education, actively shared their expertise to cultivate teacher talents. Additionally,

PLN leaders and their core teammates are crucial elements facilitating the initial stage of PLNs. Apart from the vital support from college coordinators and budgets, the findings reveal that leaders' charisma, strong leadership qualities, and the presence of a dedicated core team are key factors in facilitating the initial stages of PLNs. The core team forms the foundation for gaining collective trust and support for the PLN leaders, thereby making the initial PLN formation smooth and feasible. These core members, often chose from the leader's acquantances, play a crucial role in sharing practices and knowledge, fostering group dynamics, and providing emotional support to the PLN leaders and members.

Leveraging online tools for for effective facilitation of PLNs. The findings indicate that PLN leaders, core teams, and members leverage online platforms to promote collective collaboration effectively. Among the most frequently employed tools were LINE Chatrooms, Google Forms, and Google Classroom and Meet. These platforms offer free accessibility, enabling seamless co-editing of files, sharing information, and fostering open discussion. Additionally, some PLN leaders utilized the MOE-sponsored platform for further collaboration. Line Chatrooms were primarily used for social networking and message exchanges, while Google Classroom was preferred for professional discussions and continuous collective learning.

Reflective practice and collective learning in PLNs. The findings indicate that the size of a PLN influences the nature of learning interactions. Larger PLNs tend to prioritize collective learning, where participants attend meetings, receive information, and work individually on specific projects. Conversely, smaller PLNs focus on collective actions, with members working together on joint initiatives, fostering stronger group cohesion. The research also highlights

the significance of reflection and implementation in the PLNs' learning process. Through inquiry, information acquisition, practice, reflection, and sharing, participants engage in a continuous learning cycle that encourages experimentation, knowledge exchange, and collaborative refinement of teaching practices.

Discussion and Conclusion

The study sheds light on the formation and initial implementation of PLNs in Taiwan. Three important issues emerged in the formation and implementation of PLNs, including the need for logistical support and training from coordinating colleges, the significance of emotional support from core teams, and the importance of a user-friendly and free-of-charge digital platform for virtual meetings and communication, as shown in Figure 3.

(Figure 3)

The coordinating college provides substantial support and training for the PLN leaders, serving as the central node, connecting different networks as similar as the nodal network in Figure 2. Additionally, trust and support from core team members play a pivotal role in the initial stages of forming PLNs as well. This trust fosters amiable social interactions, serving as the glue in bringing educators together for collective actions and learning. The outcomes gains of PLNs are reflected in the emotional support, information exchange, and continuous learning process among participants. However, the study notes that the level of collective action may vary depending on the size and homogeneity of PLNs, with smaller and more cohesive groups more likely to engage in collaborative actions.

In conclusion, PLNs provide a powerful platform for educators in Taiwan to address educational needs, foster professional growth, and collectively improve, and reflect on teaching practices. The study underscores the support from the coordinating college and the

PLN core teams, the leaders' personal qualities and passion, and the accessibility of digital platforms. By understanding these key elements, educational institutions and policymakers can promote the formation and implementation of effective PLNs, ultimately driving positive changes in the educational community. (Word count: 1957)

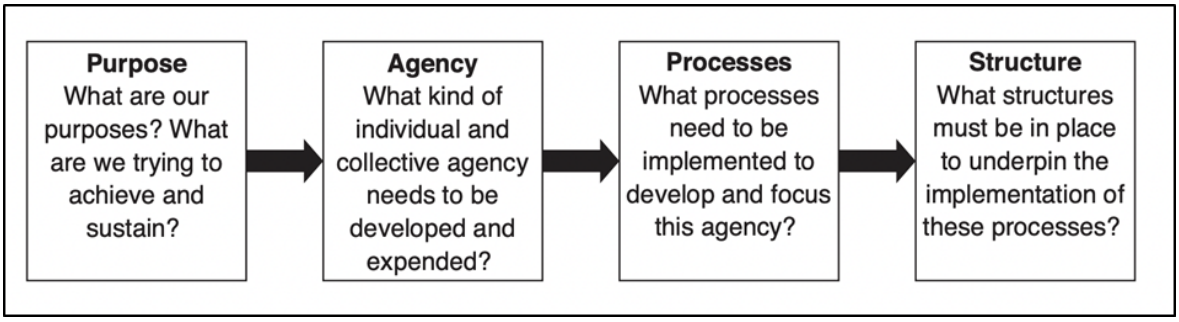

Figure 1. The design flow of a network, adopted from *Leading School-based Networks* (p.24), by M. Hadfield & C. Chapman, 2009

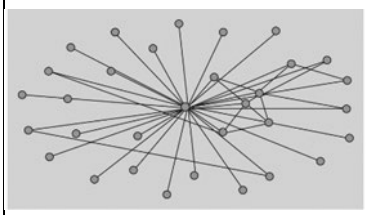	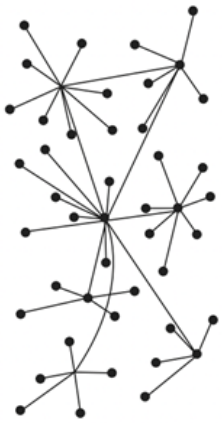	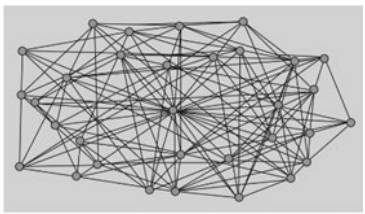
a hub and a spoke network	a nodal network	a crystalline network

Figure 2. Three structures of the professional learning networks, adopted from Hadfield and Chapman (2009), p.36-37

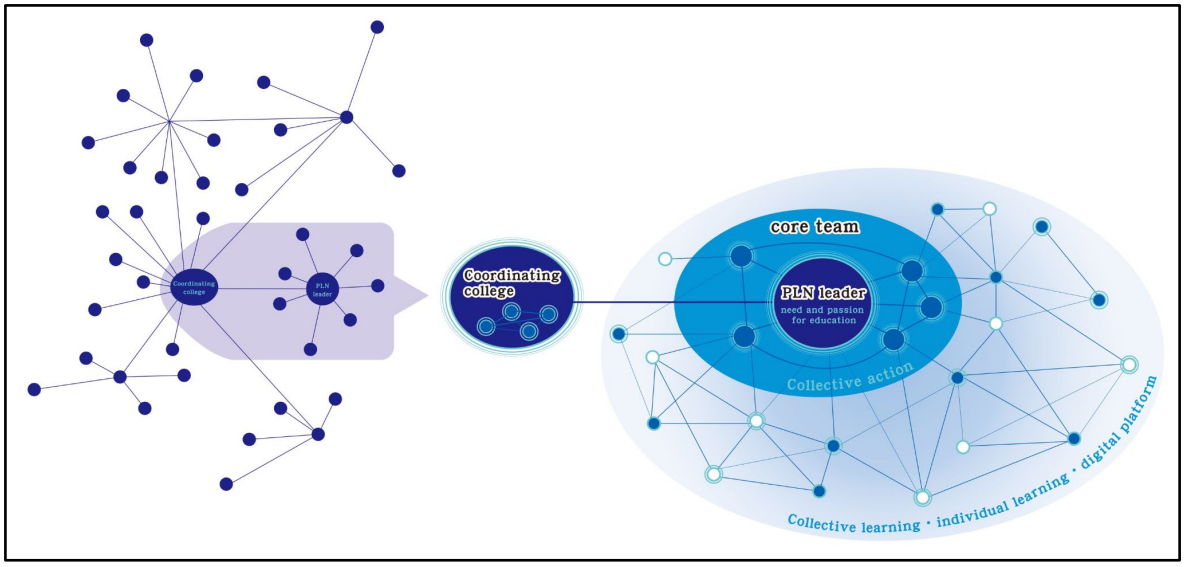

Figure 3. The structure of PLN implementation in Taiwan: Coordinating colleges, PLN leaders, core teams, and digital platforms

Table 1.
Profile of six PLN participants in the focus group

Leader	Name	Position	Educational Level	Objectives
Leader A	Hong	section chief	high school	Learning portfolio
Leader B	Ke	director	elementary school	Induction and pre-service teacher counseling
Leader C	Lin	director	middle school	induction program
Leader D	Ye	teacher	middle school	Science lesson plan
Leader E	Chen	director	elementary school	Competency-based test design
Leader F	Shih	director	high school	Interdisciplinary collaboration

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