Teacher Collaboration in China and Curriculum Improvement: A Narrative Inquiry into Teachers' Real and Cover Stories

Yujie Liao
Department of Integrated Studies in Education
Faculty of Education
McGill University, Montreal
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Abstract

In the past two decades, teachers in Chinese public schools have become accustomed to working collaboratively to teach based on their subjects. Teaching Research Groups (TRGs) are typical of teacher collaboration in China, combining the administrative and professional nature of teachers' work in schools. Previous studies on teacher collaboration around the world have revealed the diverse forms teacher collaboration can take, as well as demonstrating how such collaboration can reduce the negative impacts of teachers' often isolated conditions while promoting teachers' professional growth. Building on the double-story structure, my research questions asked: What are the real stories told by teachers about teacher collaboration? What are the cover stories told by teachers about teacher collaboration? How do different stories told in and of teacher collaboration enhance or hinder curriculum improvement? To understand teachers' real experience in collaboration, I use the double-story structure of *cover stories* and *real stories* as a lens on research into teacher collaboration in China. The double-story structure emphasizes that teachers are living two versions of stories in their school life, one being the cover story, which is officially authorized and can be safely expressed in public, and the other being the real story, which may be inconsistent with the cover story and thus suppressed. Drawing on narrative inquiry, I explored the stories of five Chemistry teachers from a school in southwest China. I conducted immersive observations to understand in depth teachers' daily interactions with one another, observed their collaborative research project discussions, and interviewed each teacher twice. In the thesis, I present the five teachers' individual narrative accounts, honing in on their research project as a case of teacher collaboration. Three main findings emerged with respect to the relation between cover and real stories in the teachers' stories: 1) teachers' strong emotional commitment to the group they belonged to, but where that commitment prevented them from engaging in deep discussion and debate; 2) the student-centred goal that animated their teacher collaboration as dwindling; 3) teachers distinguishing between informal and formal collaboration; teachers preferred informal dialogue and communication, but the professional title evaluation system granted legitimacy to the formal research process thus preventing teachers from telling their real stories. I conclude that the teacher collaboration failed to foster a genuine culture of inquiry. I posit a kind of *collective story* that came to act as a cushion between cover stories and real stories. Collective stories were integrated into teachers' personal lives and real stories, generating a collective agency; however, teachers' real stories became covertly covered, thus inhibiting individual agency.

Résumé

Au cours des deux dernières décennies, les enseignants des écoles publiques chinoises ont pris l'habitude de travailler en collaboration pour enseigner en fonction de leurs matières. Les groupes de recherche sur l'enseignement (TRGs) sont typiques de la collaboration des enseignants en Chine, combinant la nature administrative et professionnelle du travail des enseignants dans les écoles. Des études antérieures sur la collaboration des enseignants dans le monde entier ont révélé les diverses formes que peut prendre la collaboration entre enseignants, ainsi que la démonstration de la manière dont une telle collaboration peut réduire les impacts négatifs des conditions souvent isolées des enseignants tout en favorisant leur croissance professionnelle. En m'appuyant sur la structure à deux étages, mes questions de recherche étaient les suivantes: Quelles sont les vraies histoires racontées par les enseignants au sujet de la collaboration entre enseignants? Quelles sont les histoires de couverture racontées par les enseignants sur la collaboration des enseignants? Comment les différentes histoires racontées dans et de la collaboration des enseignants améliorent-elles ou entravent-elles l'amélioration du curriculum? Pour comprendre l'expérience réelle des enseignants en matière de collaboration, je prends la structure à deux étages des histoires de couverture et des histoires réelles comme une lentille dans cette recherche sur la collaboration des enseignants en Chine. La structure à deux étages met l'accent sur le fait que les enseignants vivent deux versions des histoires dans leur vie scolaire, l'une est l'histoire de couverture, qui est officiellement autorisée et peut être exprimée en toute sécurité en public, et l'autre est l'histoire réelle, qui peut être incompatible avec l'histoire de couverture et supprimée par l'histoire de couverture. En m'appuyant sur une enquête narrative, j'ai exploré les histoires de cinq professeurs de chimie d'une école du sud-ouest de la Chine. J'ai mené des observationsimmersives pour comprendre les interactions quotidiennes des enseignants entre eux, observé leurs discussions de projets de recherche collaboratifs et interviewé chaque enseignant deux fois. Dans la thèse, je présente les récits narratifs individuels des cinq enseignants, en affinant ce projet de recherche comme un cas de collaboration entre enseignants. Trois constatations principales ont émergé en ce qui concerne la relation entre la couverture et les histoires réelles dans les histoires des enseignants: 1) le fort engagement émotionnel des enseignants envers le groupe auquel ils appartiennent, mais où cet engagement les empêchait de s'engager dans une discussion et un débat approfondis; 2) l'objectif d'être centré sur l'élève stimule la collaboration des enseignants, mais cet objectif est en déclin; 3) les enseignants faisant la distinction entre la collaboration informelle et formelle; les enseignants préféraient le dialogue et la communication informels, mais le système d'évaluation des titres professionnels confère une légitimité au processus de recherche formel, ce qui empêche les enseignants de raconter leurs histoires réelles. J'en conclus que la collaboration des enseignants n'a pas réussi à favoriser une véritable culture de la recherche. Je postule l'existence d'une sorte d'histoire collective qui agit comme un tampon entre la couverture et les histoires réelles. Les histoires collectives ont été intégrées dans la vie personnelle et les histoires réelles des enseignants, générant une initiative collective;

cependant’ les histoires réelles des enseignants ont été couvertes secrètement, inhibant ainsi le libre arbitre individual.

Chapter 1 – Introduction

Research Interests and Puzzles

In Spring 2021, I worked as an English subject teacher for one semester in an urban public primary school in China. Due to the lack of teachers in that school, the principal required me to teach four classes at once, which was a great challenge for me with limited teaching experience. I didn't know how to ensure consistency in my teaching across the four classes, and my students in each class were quite different in their characters and knowledge foundations, which posed a huge challenge to me as a novice teacher. Fortunately, I had a group of generous teacher predecessors who never failed to share their wisdom with me – my teacher colleagues. In public schools in China, it is common for teachers of the same subject to share an office. Whenever, feeling dissatisfied and overwhelmed by my inability to solve students' problems, I returned from the classroom to that office shared with the four English teachers, the other teachers – no matter how busy they were – were eager to offer me advice and share their experiences with me. I learned quite a lot of knowledge and strategies necessary to become a teacher from those peer relationships. With the help of the teachers' collective wisdom, I grew from a novice teacher who did not know how to respond to students to a more confident and skilled teacher.

At the same time, both the school and the city's Education Bureau where I worked had policies that required teachers to collaborate for curriculum improvement and professional development, which was administratively arranged in our daily work as a weekly meeting for English subject teachers on collective lesson preparation. Each teacher was assigned to observe and record other teachers' lessons every two weeks. However, in those meetings, my colleagues behaved contrary to their usual positive behaviours. They tended to remain silent in the meetings. Only the subject team leader spoke, asked questions and summarized. In our mutual lesson observations, my colleagues jotted down some insights in their own notebooks and hurried back to their seats after the lessons. What I saw gave me a feeling that "the tasks were done", rather than that real sense of mutual assistance that I

received when asking them for help, informally, on a daily basis.

I started to feel genuinely curious. Why did my fellow teachers, who had never been stingy about sharing knowledge and insights, become silent in the work arrangements that were specifically designed to promote "collaboration"? Was it possible for teachers to actually gain some kind of professional growth from those activities? Thanks to the wisdom and support I received from my colleagues, I had always believed that an office shared by teachers was a fertile ground for a collaborative culture, but in light of countervailing evidence, I began to feel shaken and confused. Therefore, I decided to re-approach a group of teachers, this time from my perspective as educational researcher, and explore and inquire into how collaboration played a role in their lived experience as teachers. In the followed sections, I will introduce the narrative orientation adopted in the research, as well as the policy and cultural contexts in which this research takes place.

Research Orientation

In the fall of 2021, as I continued my studies as a graduate student at McGill University, I was struck by an idea in Professor Teresa Strong-Wilson's class: the curriculum can be understood and constructed in terms of lived experience. Only when a learner's past experience and self are engaged in the curriculum, can the knowledge structure acquired through the curriculum be given meaning (Greene, 2004). I began then to also appreciate the value of personal experiences within educational research. Would the same apply to teachers? I received an affirmative answer from Connelly and Clandinin, important pioneers of narrative inquiry in the field of education. Connelly and Clandinin (1988) counted teachers' "personal knowledge" (p. 4) as a decisive factor in the classroom and a fundamental lens for understanding the curriculum. They advocated a whole perspective for defining the "personal" in the curriculum, that is, viewing the personal as "something in the past, something in the present, something in the future" (Connelly & Clandinin, 1988, p. 24). Based on this perspective, Connelly and Clandinin (1988) attached great importance to narrative, because in their opinion, telling and retelling stories are the ways by which people

endow their experience with meaning, and such telling of the past or present can predict the intention of teachers' actions in future situations. Clandinin and Connelly (1995) expanded the meaning of the personal, as applied to teachers, to a metaphor of "the professional knowledge landscape" (p.4), which they used to emphasized that various elements, such as time, space and people, both inside and outside the classrooms, are interwoven with teachers' lived experience, affecting teachers' professional knowledge and their practice. Their arguments have provided a way to use narrative to explore teachers' experience in complex educational situations, allowing researchers to focus on the influence of teachers' life outside the classroom, school stories (Clandinin & Connelly, 1996) and even of social cultural contexts (Connelly et al., 1997) on teachers' educational practice. This breadth is not based on a generalizing of educational activities, but is brought about by the recognition of the complexity and integrality of the teacher experience itself. As claimed by Clandinin and Connelly (1991), teachers' experience is rooted in teachers' lives, and narrative is both an integral part of teachers' educational experience as well as a gateway by which to enter their experience.

I remembered the shared office of our English teachers, the spontaneous supportive conversations among us, and then the silent moments of the teachers during those weekly meetings. If I view those events and moments as the background to the teachers' teaching experience, then the telling and retelling of teachers' stories may help bring these events outside the classroom to the "foreground" (Clandinin & Connelly, 1991, p. 260). Exploring teacher collaboration through narrative means that I view those moments as part of teachers' lived experience in the school, in order to understand the significance of spontaneous as well as designed collaborative activities for teachers, in their teaching, school life, and the curriculum. In Chapter 3 – Methodology, I will further discuss the use of narrative inquiry in this research.

Research Context

In this part, I will introduce the cultural and social context of this research to

familiarize readers with some terms that may be used in my research on Chinese teachers.

The County School and County Teachers. There are three levels of administrative divisions in China: *province* (sheng), *county* (xian) and *town* (xiang). Scholars usually nuance the use of this three-level division, pointing to the disparity of educational resources among the city, county and township (or country) areas (Bao, 2006; Wang, 2011). Since a county is composed of multiple towns and villages, teachers working in county and township may have a background of rural life and face a relative lack of educational resources in comparison with urban teachers (Bao, 2006), so teachers working in county and township areas can both be called rural teachers. I use the term **county teachers** to describe my research participants because some studies have also discussed the unique educational dilemma of compulsory education schools in county areas in China. For example, Fan (2014) has pointed out that China's county areas are in the process of urbanization, that is, the rural population is continuously migrating to the county area; the accompanying education problem is that the number of students in schools located in rural areas decreases, flowing instead to county schools. Therefore, the number of rural schools is decreasing gradually, while the scale of county education expands. Many students in these county schools live in remote rural areas, so county schools have to provide housing for their teachers and students. The schools face tremendous pressure, given their limited teaching resources and infrastructure.

Conditions of Working in A County Secondary School. Secondary school covers the last three years of China's nine-year compulsory education; a student's education is no longer mandatory after graduation. Most secondary school students in urban areas will be admitted to academic high schools after graduation and continue to pursue higher education through the middle school entrance examination. In contrast, a considerable number of secondary school students in counties will end their academic education after graduation and instead opt to study in vocational schools to accumulate employing-related skills and specialties. In S school, the pseudonym for my research site, advertisements about local vocational schools could be seen everywhere on the official bulletin boards of the school.

After the high school entrance examination, teachers of S school would take some students to visit local vocational schools to become familiar, in advance, with the specialties and teaching environments of various vocational schools.

Since the mainstream social belief is that academic education is more conducive to students' lifelong development, S school divides students into classes according to their academic scores from the previous year. As a result, students who have better scores and are more likely to be admitted to academic high schools are entitled to a more concentrated training for the examination. Therefore, improving students' grades is one of the critical goals of teachers in S school, especially those who teach classes of "better" students. In S school, teachers of the same subject often share the same office, and each office accommodates about eight teachers so that teachers of the same discipline can communicate conveniently and share exam-oriented resources of the same discipline. The shared office is based on a plan typical of other China public schools. Apart from the classrooms, these subject-based offices are where teachers spend the most time in school and are thus an important site of teacher stories.

Research Questions

The rise of teacher collaboration in China is related to an educational reform in basic education carried out by China's Ministry of Education at the beginning of the 21st century, namely the *New Curriculum Reform (NCR)* (Guo, 2012). Reforms in China are usually carried out in a top-down and "run in tandem" way (Xu & Connelly, 2009), that is, based on a macro file that maps out the fundamental reform philosophy by the Ministry of Education, with various educational improvement policies running simultaneously in multiple regions. Consequently, it is usual to see several policies with different goals running together, thus increasing teachers' workload and accountability (Zeng et al., 2017; Shi & Zhu, 2021). Under such conditions, the risk is that teacher collaboration becomes a mere formality, enacted at a superficial level.

The design and questions of this research have been inspired by the work of Olson

and Craig (2005), who revealed that out of a need for self-protection, teachers choose to claim to know "what they are supposed to know" (p.165), but keep silent about their real feelings or declare that they do not know about those feelings. Combining my interests in teacher collaboration with Olson and Craig's arguments, I assume that not all stories shared in teacher collaboration will be the real stories that "motivate one's course of action" (Olson & Craig, 2005). Olson and Craig introduce the concept of *cover stories* (from Crites, 1979) into the field of teacher knowledge, arguing that a cover story is a "communally authorized version" story that aims to hide actual conflicts in educational organizations (p.178). The presence of such stories is concerning since they undermine teachers' authority and potentially thwart valuable reforms in the curriculum and schools. Using the concept of a double-story structure (real; cover) of teacher stories, my research aims to depict the stories that Chinese teachers tell while working in collaboration as well in discussing collaboration. My research questions are as follows:

1. What are the real stories told by teachers about teacher collaboration?
2. What are the cover stories told by teachers about teacher collaboration?
3. How do different stories told in and of teacher collaboration enhance or hinder curriculum improvement?

Thesis Overview

There are seven chapters in this thesis. In *Chapter 1 – Introduction*, I begin with my previous experience as a primary school teacher in which I found my research interests in and puzzles about teacher collaboration, then I introduce the narrative orientation, the social background and the questions of my research. In *Chapter 2 – Literature Review*, I review the literature on teacher collaboration, from a western perspective as well as in China. I also review the literature on teacher stories and teacher collaboration, which provided the theoretical foundation for my research. In *Chapter 3 - Methodology*, I introduce the methodological basis of narrative inquiry adopted in this study and provide the rationale for use of this approach. I describe the site of this study, the way the five teachers were recruited

and how the data were collected and analyzed. In *Chapter 4 – Narrative Accounts*, I present the narrative accounts of the five teachers as well as their stories about their daily collaboration. In *Chapter 5 – The Case: Chemistry Teachers' Research-Based Collaboration*, I focus on Chemistry teachers' research project as a case of teacher collaboration. This chapter reveals the teachers' motivations, feelings, difficulties and future expectations for teacher collaboration. This chapter also hones in on analysis of the teachers' cover stories and real stories that emerged, in response to the research questions. In *Chapter 6 – Discussion*, I discuss the teacher stories in relation to the literature, and demonstrate how the teacher stories in my research respond to existing theoretical perspectives. *Chapter 7 – Conclusions* provides a retrospective summary of the research and my findings, reflects on myself as a researcher, identifies the limitations of the research and maps out prospects for related research in the future.

Chapter 2 – Literature Review

Introduction

In this chapter, I selectively review the existing literature in light of my research interest and experiences in Chinese education. The chapter begins by reviewing the literature and policy documents on how teacher collaboration emerged. This is followed by a review of the literature on trends in research on teacher collaboration over the last two decades. Finally, this chapter concludes by discussing the connection between teacher stories and teacher collaboration to address the theoretical stance my research has adopted.

Teacher Collaboration: Histories and Definitions

History and Development: Collaboration in relation with School System

Today, formal and informal collaboration among teachers has become the norm in school systems around the world, but if we look back on history, collaboration does not seem to be an innate practice path for teachers as a profession. According to Maeroff (1988), the structures of schools and classrooms predestine teachers to be isolated rather than collaborative:

> Teachers, separated as they are in their classrooms, normally have little time to share and compare ideas. Professional growth is bound to be impaired in a setting where practitioners, in this case teachers, do not see their colleagues practice their profession and hardly ever teach each other techniques. What a difference, for example, from a team of lawyers who prepare a case together or a group of surgeons who confer about how to handle a medical procedure. The organizational structure of schools, so far as the professional staff is concerned, is built on a series of one-to-one relationships. Since there is little incentive for teachers to integrate their behavior with that of other teachers, they tend to go their own ways. (Maeroff, 1988, p.23-24)

Maeroff's views seem to echo Lortie's descriptions of teachers' dilemmas in schools. Analyzing teachers' efforts to reach students, Lortie (1975) explained the paradox of teacher autonomy: teachers need to make individual decisions on assessing students, maintaining

classroom discipline while at the same time occupying a less-resourced, subordinated status within school systems. Struggling with various (and even conflicting) demands, teachers' attempts to have control over more resources, their desire for autonomous practices, and the avoidance of interference by others (mainly from the school organization) (Lortie, 1975), it seems inevitable that teachers will slip into isolationism and tend to reject collaboration with their colleagues. A large-scale study by Goodlad (1984) also found that the autonomy of teachers is inextricably linked with their isolated conditions:

> [Teachers'] autonomy seemed to be exercised in a context more of isolation than of rich professional dialogue about a plethora of challenging educational alternatives. The classroom cells in which teachers spend much of their time appear to me to be symbolic and predictive of their relative isolation from one another and from sources of ideas beyond their own background of experience. (p. 186)

In other words, though teaching as a profession shares similar knowledge, skills, working conditions and responsibilities for students, collaboration is not a natural strategy given that school settings tend to isolate teachers from one another (David, 2009).

Part of the call for collaboration stems from concerns of policy makers and scholars about teachers' individualism, the requirement to strengthen educational institutions' ability to solve complex educational issues, and the need to promote teacher professional development and improve teaching and learning in school communities (Darling-Hammond & Richardson, 2009; Hamilton et al., 2009; Levine & Marcus, 2010; Little, 2003; Ronfeldt et al., 2015; Schmoker, 2005). Nonetheless, Cochran and Lytle (1993) have argued that the isolated environment of teachers may actually motivate teachers to seek out collaboration. As a result, scholars have launched a series of discussions on the development of a culture of teacher collaboration in the school system. A review by Hargreaves and O'Connor (2017), for instance, examined how teacher professional cultures can develop into collaborative ones. They summarize the historical development of teacher professional cultures in the following five phases: 1) *the culture of teaching* – as an occupation, teaching has its cultural attributes

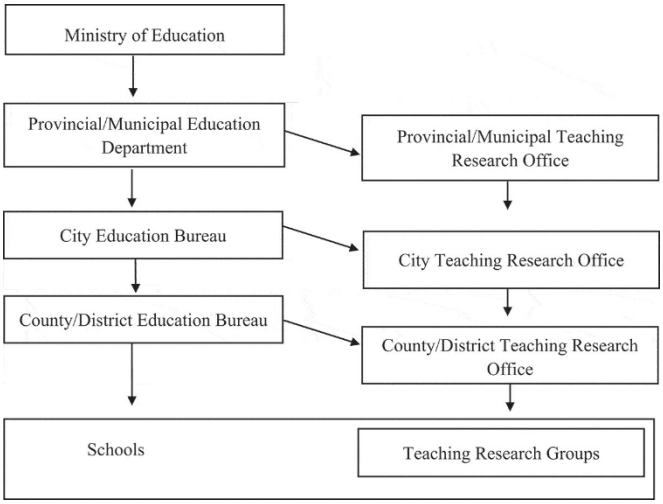
with its specific skills, strategies and practices; 2) *the culture of individualism* – taking the work of Lortie (1975) as the typical representative, teaching is full of uncertainties and conservatism and has an individualist nature; 3) *cultures of individualism and collaboration* – beginning in the 1980s, while still acknowledging the individualism in teaching, groups of teachers and educational institutions began to recognize the importance of fostering a culture of mutual assistance and support among teachers; 4) *strong and weak collaboration* – the different forms, levels and strengths of collaboration, as well as the advantages and disadvantages of collaboration began to be discussed; 5) *designing professional collaboration initiatives and interventions* – focused discussion began on strategies, designs and interventions possible through collaboration.

Since it may be difficult for teachers to spontaneously form collaborative relationships, external forces, such as educational reforms initiated by schools or educational bureaus, assisted in organizing, promoting and implementing teacher collaboration. In order to improve teachers' participation and sense of ownership in schools, teacher collaboration became a feature of American educational reforms around the 1990s (Friend & Cook, 1990); since the early 2000s, China's New Curriculum Reform also advocates teacher collaboration (National Institution of Education Sciences [NIES], 2012; Zhong, 2005). In the following part, I will focus on the historical development of teacher collaboration in the context of China.

The form of teacher collaboration that has enjoyed the longest trajectory since the founding of the People's Republic of China and has exerted the most profound impact on other types of teacher collaboration is *teaching research groups* (TRGs) (Hu, 2021; Liu & Xiu, 2019; Paine & Ma, 1993). TRGs can be traced to the *Regulations on the Work of Teaching and Research Group in Middle Schools (Draft)* issued by the Ministry of Education in 1957 (Li, 2014; Shan, 2014), which proposed TRGs as non-administrative, research-oriented organizations in schools composed of multidisciplinary teachers aiming to improve practice through studying textbook guidelines, researching policies and materials issued by

the Ministry of Education, and collectively observing and discussing each other's teaching (Hu, 2021; Li, 2014). China's Ministry of Education exerts influences on the TRGs through the official departments of different regions and levels, thus making the TRGs and their affiliated institutions part of the official system (Chen, 2020; see Figure 1).

Figure 1 The structure of Chinese teaching research system (Chen, 2020)



The TRGs were initially the results of China's imitation of educational developments in the Soviet Union; around the 1950s, the TRGs served political and ideological purposes rather than supporting teachers' development (Chen, G, 2006; Chen, L, 2020; Hu, 2021; Zhou, 2021). Between the 1970s and 1990, after the educational disruption caused by the Cultural Revolution and the rapid expansion of compulsory education brought about by the end of the Cultural Revolution, the political function of TRGs was weakened; after 1990, they were then re-established and re-normalized to promote teachers' communication, pedagogical effectiveness and professional ability (Chen, 2020). Around the 1990s, the concept of *professional learning communities* (PLCs) put forward in western academia had an impact on the field of educational research in China; many scholars regarded the TRGs as the best representative form of PLCs in the Chinese context. Even though there are differences between the two, Chinese researchers who focus on the theories and practices of PLCs often use the TRGs as a foothold for their research (Qiao et al., 2018; Zhang & Pang,

2016;).

In the late 20th century, the translation and introduction of the concept of *educational action research* further advanced the widespread practice of TRGs on Chinese campuses (Bu, 2010). With the popularization of educational action research in China, Chinese scholars emphasized the teacher's role as the actor in educational reforms and placed teachers' daily teaching problems as the basis for reforms (Lu & Wang, 2009). Consequently, teachers' collective power rather than individual one has been strengthened – Chinese teachers communicate and collaborate frequently through joint meetings and demonstration lessons to identify the teaching problems worth researching (Li, 2019).

Scholars have also discussed other modes of teacher collaboration accompanying the TRGs. Wu and Clarke (2018) reviewed the emergence of what is known as the *Open Class* in China and its changing relationship with teacher professional development. They concluded that the common form of Open Class is organizing a group of teachers of the same subject to observe a teacher's class and carry out evaluation and feedback, which is approximately equivalent to the Demonstration Class in the western context. The feedback that teachers receive will not directly affect job promotion, so the Open Class can be normalized in Chinese schools as a regular strategy for teachers to learn from one other's teaching experience (Wu & Clarke, 2018). Nonetheless, the routinized Open Class has also attracted criticism from scholars, who suspect that the turning of teachers' 'private' classroom spaces into open ones can tend to produce formalistic performance instead of natural and authentic teaching; this, in turn, may prevent teachers from benefiting from authentic joint learning (e.g., Chen, 2005; Guo, 2003; Zhu & Qin, 2008). School-based joint lesson preparation and planning is also a daily form of teacher collaboration. In the Chinese context, teachers of the same subject in public schools prepare lessons collectively through regular conferences, relying on the organizational structures of the TRGs (Liu, 2013; Luo & Zhou, 2015). Teachers' collaborative discourses, resource sharing and negotiation in joint lesson planning are also a major research focus of educational scholars in China (Yuan & Zhang, 2016).

Given that the TRGs are the most representative and widely discussed collective practice of Chinese teachers, the administrative and professional attributes of the TRGs have made them amenable to be integrated into peer-supportive teaching and research activities, which can then inform the routine teaching work of front-line teachers (Hu, 2021; Liu & Xiu, 2019; Paine & Ma, 1993).

The historical development of the TRGs reveal some distinctive characteristics of Chinese teacher collaboration (Chen, 2006; Paine & Ma, 1993; Zeng et al., 2017; Zhang & Pang, 2016; Zhang & Wong, 2018):

1) teacher collaboration is highly influenced by top-down administrative requirements;

2) teacher collaboration conforms to the collectivism culture of China society; consequently, collaborative activities in schools have the potential to strengthen teachers' sense of identity and dependence on their peers and the collective power of the school;

3) since teacher collaboration in China is greatly affected by institutional arrangement (enacted as a policy tool; Zeng et al., 2017) and the bureaucratic nature of its practice, how collaborative activities are organized may deprive teachers of a sense of autonomy and the ability to individually arrange working time, thus eroding meaningful reflection and exploration.

To date, curriculum reform in China still calls for more systematic teacher collaboration. However, few studies in China have focused on the integration of teacher collaboration into teachers' daily work and the impacts of institutional arrangement (Zeng et al., 2017), namely, hours and places uniformly planned by the school or the Education Bureau for teacher collaboration. In the following sections, I review definitions and discussions of teacher collaboration so as to decide on an appropriate perspective for this study.

Definitions and Forms of Teacher Collaboration

For some scholars, teacher collaboration refers to the same research phenomenon as teacher teams and professional communities of practice (Vangrieken et al., 2015). This

section will review the literature that discuss the contents and forms of teacher collaboration as a practice and provide an operational definition of teacher collaboration in keeping with the focus of my research.

Little's (1990) exploration of teacher collaboration is often cited in the literature. Little suggested a continuum of collegial relations, categorizing teacher collaboration according to a progressive order from independent to interdependent, as follows: 1*) Storytelling and scanning for ideas*. Due to highly isolated teaching spaces in schools, teachers seek out occasional opportunities, exchanging their practices in their spare time at work. While these stories of practices have the potential to form collective identity and reveal knowledge and beliefs, Little (1990) has expressed doubts about these stories' ability to facilitate teacher development; 2) *Aid and assistance*. Little used this set of conceptions to refer to teachers' mutual helping of one another. At this stage, teachers' motivation to provide advice is still very weak, because teachers are concerned about others' teaching privacy; 3) *Sharing*. Sharing is a more public form of exchange of teaching materials and teaching ideas. It is more widespread and reciprocal and therefore has the potential to reveal teaching patterns. However, it also remains uncertain, as teachers may shy away from sharing in order to avoid damaging their relationship with other teachers. 4) *Joint work*. Joint work means teachers' taking joint responsibility, recognizing their collective identity. Joint work is "dependent on the structural organization of task, time and other resources in ways not characteristic of other forms of collegiality" (p.519), thus giving birth to teachers' dependence on each other rather working alone. Little's (1990) discussion creates a broad picture for the subsequent research on teacher collaboration, that is, what form of teachers' collective activities can be regarded as collaboration and studied as such. Next, I will review how other scholars conceptualize various elements of collaboration.

Johnston's (1990) definition refers to cross-school and project-based collaboration: "collaboration is proposed as a way to increase quality, bridge the gap between theory and practice, and improve communication between universities and schools" (p.173). Cook and

Friend (1991) have given a broad definition of collaboration: "collaboration is a style for direct interaction between at least two co-equal parties voluntarily engaged in shared decision-making as they work toward a common goal" (p.6). They have argued that collaboration is voluntary; it requires a common goal and parity among participants; it includes shared responsibility; participants share accountability for outcomes; some elements of collaboration (such as professionals' mutual trust) will be strengthened during collaboration. For their part, Hall and Wallace (1993) define collaboration as "a way of working where two or more people combine their resources to achieve specific goals over a period of time" (p. 103). They further unpack this definition: people in collaboration can be within one institution or be working across institutions, and the shared tasks of collaboration are usually linked to its members' institutional roles. Collaboration distinguishes itself from other ways of working by being in an egalitarian, voluntary working relationship rather than one of command and obedience.

Hargreaves (1994) discusses teacher collaboration from a micropolitical perspective that sheds light on "the use of power to achieve preferred outcomes in educational settings" (Blasé, 1988, as cited in Hargreaves, 1994, p.190). Hargreaves (1994) argued for five characteristics of collaborative working relationships: 1) *spontaneous* – born out of teachers' need; 2) *voluntary* – driven by the value that teachers perceive rather than other coercive factors; 3) *development-oriented* – teachers are committed to a common goal of self-development instead of catering to others' demands; 4) *pervasive across time and space* – collaborative cultures go beyond fixed working procedures and schedules, and permeate informal conversations as well as teachers' school lives; and 5) *unpredictable* – teachers' individual freedom to act and decide in collaboration makes the outcomes of collaboration unpredictable. He distinguished between collaborative culture and contrived collegiality, explaining that the former is more spontaneous and based on teachers' "perceived values," while the latter is a result of administrative pressure, the outcome of which is more predictable. Given his identification of "contrived collegiality", Hargreaves (1994) cautioned

that not all forms of teacher collaboration will produce desired results, and that compulsory, time- and space-bounded collaboration that does not serves the need of teachers will lead to inflexibility and ineffectiveness.

Professional learning communities (PLCs) are viewed as examples of collaboration in schools; the term is sometimes interchangeable with professional communities (Friend & Barron, 2015; Vangrieken et al., 2015). Louis et al. (1996) identified five critical elements of professional communities: 1) *shared norms and values* – clear, reinforced values and norms that support teacher success; 2) a *focus on student learning* – teachers' obligation to see the intellectual development of students as the primary goal; 3) *reflective dialogue* – teachers' discussions in which they evaluate themselves and schools; 4) *deprivatization of practice* – sharing and discussing with the community the uncertainties that teachers cannot solve alone; and 5) *collaboration* – as a result of reflective dialogue, teachers establish mutual understanding and work together to produce pedagogical materials. A similar view of PLCs can be found in the work of Hord (2004), who boiled down PLCs to five intertwined dimensions: "supportive and shared leadership, shared values and vision, collective learning and application of that learning, supportive conditions, and shared personal practice" (p.1). Though the literature around discussion of PLCs is still continuing to enrich the field, to sum up, PLCs emphasize the school as a whole community with shared and long-term ideals; the school staff including the principal are bounded together to establish a collaborative culture schoolwide, rather than organizing small scale or small groups of teacher collaboration (Hord, 2004; Louis et al., 1996; Stoll et al., 2006; Vangrieken et al., 2015).

The notion of communities of practice (CoP) elaborated by Lave and Wenger in their situated learning theories is also critical to understand teacher collaboration. Some scholars believe that CoP is the cornerstone of establishing PLCs (e.g., Vangrieken et al., 2015). Lave and Wenger (1991) discuss the learning process from a sociocultural perspective:

> Learning viewed as situated activity has as its central defining characteristic a process that we call *legitimate peripheral participation*. … learners inevitably participate in

> communities of practitioners and … the mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community. … It concerns the process by which newcomers become part of a community of practice. A person's intentions to learn are engaged and the meaning of learning is configured through the process of becoming a full participant in a sociocultural practice. (p. 29)

Lave and Wenger (1991) defined CoP as "a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice" (p. 98). Wenger (1999) concluded that three elements contributing to the coherence of a community are: 1) *mutual engagement* – participants of a CoP enjoy mutual relationship and are bound together and involved by what they do in the community; 2) *joint enterprise* – reflects coherence within the community, and is achieved through participants' mutual interaction and negotiation. Joint enterprise does not necessarily imply a harmonious relationship but enables participants to maintain their positions in the community but in dynamic interaction; and 3) *shared repertoire* – participants of a CoP will develop a repertoire which they then share and which reflects co-construction of meaning within the community, such as generation of norms, conventions and terms; the repertoire provides resources for the negotiation of meaning existing within the community, enabling the production of new meaning. Since CoP entails a dynamic learning process, some scholars prefer to use the CoP paradigm along with a micro socio-cultural perspective so as to analyze the learning and knowledge-changing status of teachers as they work in collaboration with one another (e.g., Ahmed Hersi et al., 2016; Horn et al., 2017) and as they test the security of their collaborative environment and the degree of their common commitment to collaboration (Patton & Parker, 2017).

Cochran-Smith and Lytle have also regarded teachers' collective inquiry in community as a kind of collaboration. Cochran-Smith and Lytle (1999) discussed three forms of knowledge: *knowledge-for-practice*, *knowledge-in-practice*, and *knowledge-of-practice*.

Knowledge-for-practice refers to "formal knowledge", the knowledge base that teachers learn from university scholars, educational theories, pedagogy and so on, while *knowledge-in-practice* becomes embedded in teachers' actions and is generated from teachers' experience and reflections on their practice. The third kind of knowledge, *knowledge-of-practice,* does away with the distinction between knowledge/theory and practice and is "produced in the activity of teaching itself" (Cochran-Smith & Lytle, 1999, p.273), so is not a kind of knowledge external to the learner. Teachers' collective inquiry as a source of knowledge generation belongs in this third category. Cochran-Smith and Lytle (1993) argued that teacher inquiry "ought to be regarded as an integral part of the activity of teaching and as a critical basis for decisions about practice. … classrooms and schools ought to be treated as research sites and sources of knowledge that are most effectively accessed when teachers collaboratively interrogate and enrich their theories of practice" (p. 63). They further identified teachers' collective inquiry as a form of teacher research, that is, the "systematic, intentional inquiry by teachers about their own school and classroom work" (Cochran-Smith & Lytle, 1993, p. 24). From this perspective, teacher research is a crucial way for teachers to understand the community in which they live, and can lead to the generation of teachers' conjoined knowledge. The knowledge created by teachers through this kind of collective inquiry is community-based.

Various studies have explored teacher collaboration, and I turn to these next. Strahan (2003) looked at the joint work of teachers included in discussion, such as observing other teachers interacting with students; informal and formal dialogues regarding instructional norms; planned teacher meetings, and informal conversations among teachers (e.g., conversations in which students complain about tests fostered new teaching research). Darling-Hammond and Richardson (2009) listed three main types of teachers' collaborative practice: peer observations of practice, analysis of student work and student data, and study groups. They regarded these activities as providing possible structures for teachers' professional communities. In their quantitative research, Ronfeldt et al. (2015) divided

collaboration into four categories for further measurement: general collaboration, collaboration about instructional strategies and curriculum, collaboration about students, and collaboration about assessment. They valued the variety of teacher collaboration, while their study found that "general" teacher collaboration was the most consistent in predicting student achievement; by "general," they refer to collaboration that did not break down the content and intentions of collaboration. The researchers found that collaboration across various instructional domains (rather than single-domain collaboration or on specific topics such as instruction and student assessment) produced greater collaboration within the broader community and among teaching disciplines.

Because of the complexity of teachers' work and circumstances and the diversity of teachers' roles in collaboration, it is not easy to give a general definition of collaboration. However, taking into account the focus of my research, teacher collaboration can be defined as a form of collective work with the following characteristics:

1) It involves a *group* of teachers. A *group* refers to a collection of teachers, but a group is looser in its common goals than a *team*, thus allowing individuals' goals and responsibilities to exist as part of a common goal (Vangrieken et al., 2015).

2) A *shared* task. In teacher collaboration, all participants perceive a shared task rather than act in separate ways.

3) A *deep focus* on improving daily teaching and curriculum. Deep collaboration requires teachers to expose their underlying beliefs, which possibly entails conflicts (Vangrieken et al., 2015). Such collaboration can happen through the "informal learning" of teachers (Kyndt et al., 2016, p.1113) that is, outside of the planned and structured nature of formal learning, and instead through informal collective activities that can authentically make changes in teachers' attitudes or skills.

4) Its organization is subject to teachers' working conditions or the administrative structure of the school. This point is made in order to understand teacher collaboration as the outcome of deliberate planning, often riding the tide of school reforms (De Jong et al., 2022;

Hargreaves & O'Connor, 2017). This observation is particularly helpful in teacher collaboration in the Chinese context, which is highly influenced by administrative systems.

In the next section, I review the literature on empirical studies on teacher collaboration and summarize the main perspectives, trends and methods.

Research Trends in Teacher Collaboration

Varied Perspectives on Studying Teacher Collaboration

Existing studies on teacher collaboration can be roughly divided into three perspectives on positive or negative outcomes of: the relationships between teacher collaboration and teacher professional growth, teacher collaboration and student achievement, and teacher collaboration and educational communities or school cultures.

a) Teacher collaboration and teacher learning

Discussion of teacher collaboration of course often attaches significance to the role of collaboration in teacher learning. This perspective—with attention to the nature of the collaboration—covers many aspects of teacher professional development, including attention to the way collaboration benefits teacher learning (Egodawatte et al., 2011; Johnson, 2003; Stoll et al., 2006); from a micropolitical perspective, the interpersonal relationships or conflicts that can arise as influenced by different roles of teachers (Adamson & Walker, 2011; Eschar-Netz et al., 2022); and specific resources or changes in teaching strategies as a result of teacher collaboration (Horn, 2010; Horn et al., 2017; Jang et al., 2022).

Defining teacher learning as "an active process in which teachers undertake learning activities that lead to a shift in their cognition and/or behaviour" (p. 147), Meirink et al. (2007) found that the phenomenon of teachers' learning in collaboration is focused on seeing and understanding their colleagues' teaching methods, which influences their own practice. In a comparative study, Johnson (2003) explored teacher collaboration in four schools, pointing out that, as perceived by teachers, the benefits of collaboration are that it provides moral support, increases teacher morale and commitment to teaching, and promotes teacher learning. The downsides are that it leads to work intensification, teachers' loss of autonomy,

and may also be marred by interpersonal conflict and factionalism. Ronfeldt et al. (2015) conducted a large-scale quantitative analysis to examine in what ways different types of teacher collaboration can predict student achievement. They also explored whether the positive predictions were achieved because of how teacher collaboration affected teacher performance. They suggested that teacher collaboration focused on assessment did positively predict teacher performance. Their discussion also considered the school perspective (or as they called it: the collectivist mechanism), implying that compared to working in schools with relatively lower levels of collaboration, teachers who taught in high-quality collaborative school faculties may benefit more from a school environment that fosters teacher collaboration. Another case study by Eshchar-Netz et al. (2022) investigated the dynamic power relations and teacher status manifested in teacher discourses, revealing the contrasting positions of novice teachers and veteran teachers, which implied that their challenges of learning in community differed. For veteran teachers, the social expectations brought about by their "knowledgeable" and official role can make it more difficult for them to launch inquiry questions, while for teachers who were expected to "act like a novice," they were more likely to be observed and less likely to initiate inquiries independently (Eschar-Netz et al., 2022).

b) Teacher collaboration and student achievement

In contrast to the other two research perspectives, there are fewer studies that provide explicit evidence of the relationship between teacher collaboration and student achievement (Lomos et al., 2011; Vangrieken et al., 2015), which may be due to a dissatisfactory alignment between measures, those for teacher collaboration like PLCs and those used to explore student achievement (Doğan Selcuk & Adams, 2018). However, since the ultimate goal of teacher collaboration is to improve teaching and learning (Doğan Selcuk & Adams, 2018; Dufour, 2004), students' performance in educational activities remains as a key focus.

The existing literature largely supports the conclusion that teacher collaboration can promote improved student achievement (Hord, 1997; Lomos et al., 2011). In a widely cited

review study, Vescio, Ross and Adams (2008) reviewed the results of PLC-related research, concluding that student-centered teaching and student learning achievement are both focuses of teachers' collaborative practices in the PLC. An international comparative study of teacher collaboration between the United States and Japan based on quantitative data found that teacher collaboration among teachers in Japan did not significantly affect students' math performance, while collaboration among US teachers could positively influence students' math achievement (Reeves et al., 2017). The researchers suggested that this difference may be due to inconsistent definitions of teacher collaboration across different contexts—certainly something to be taken into consideration in my own study. They concluded that the ways in which collaboration affects student learning should be further explored.

Though scholars have optimistic expectations for teacher collaboration, the process by which such activities influence student performance still fail to obtain an agreed-upon explanation, which gives rise to a call for more multi-faceted exploration of teacher collaboration, including the investigation of the working conditions and cultural characteristics of schools (Lomos et al., 2011; Sleegers et al., 2000). Such conditions and characteristics are often also factors in student (and teacher) performance.

c) Teacher collaboration and school culture

Teacher collaboration implies social interactions and differentiated work culture (Bovbjerg, 2006); thus, attention should also be paid to the school context as the working conditions and social systems under which teacher collaboration and teacher learning occur (De Jong et al., 2019). As mentioned earlier, especially when discussing the PLC, it is essential to build a culture or atmosphere within the school that can strengthen teacher collaboration and teachers' group camaraderie (Dufour, 2004). The presence of a supportive schoolwide culture is not only a source of teacher collaboration (Carpenter, 2015; Louies et al., 1996), but also a result of it (Strahan, 2003). Therefore, exploring teacher collaboration with a focus on school culture or the leadership in collaboration is unavoidable.

Strahan (2003) described the process by which teachers and administrators build a

professional learning community through data-directed dialogue, suggesting that such a process can further facilitate developing a shared cultural stance at the school, which is a crucial factor in successful school reform. Kohm and Nance (2009) regarded collaborative culture as the opposite of top-down school culture as its core features are mutual support, collective responsibility and decision-making process, the sharing of ideas, and mutual evaluation of ideas focusing on student learning. Carpenter (2015) echoed their views, adding that collaborative culture also allows teachers the flexibility to step back from collegial work and reflect on themselves. They also emphasize that distributed or shared leadership is essential to the collaborative culture.

In the context of Chinese educational research, under the influence of Confucian culture such as the respect for authorities and the pursuit of harmonious culture in schools, teacher collaboration is greatly affected by school administrative and cultural characteristics and the principal's leadership (Zhang & Sun, 2018; Zhang & Zheng, 2020). Zhang and Sun (2018) used mixed methods to explore the cultural and institutional features of teachers' professional learning communities in Chinese public schools, noting that Chinese public education is a hierarchical system so that teacher collaboration is influenced by the top-down institutional arrangement and the pursuit of harmonious interpersonal relationships. These characteristics make teacher collaboration produce positive outcomes such as shared responsibilities, shared purpose and teachers' mutual sharing and learning, while at same time teachers tended to avoid conflicts because of their excessive pursuit of harmonious culture and respect for elders (leaders or teachers).

The existing research perspectives enlighten me not to view collaboration as merely an action of teachers, but to further consider the institutional and policy contexts of teacher collaboration in China, the concern for students' learning, and the changes experienced by teachers working in collaboration.

Methods in Researching Teacher Collaboration

Choice of research method will be affected by the complexity of teacher

collaboration, the diversity of its implementation, and the interconnectedness among its different concepts. Review studies on the conceptions of teacher collaboration and meta-analysis of how it works in practice thus make up a significant proportion of the literature (e.g., De Jong et al., 2022; Hord, 1997; Lomos et al., 2011; Stoll et al., 2006; Vangrieken et al., 2015; Vescio et al., 2008).

Large-scale case studies or mixed-method studies are common. For instance, Strahan (2003) conducted in-depth lesson observation and multi-party interviews on three school cases for three years in order to explore the association between the construction of school collaborative culture and educational reforms, this so as to obtain a comprehensive and detailed interpretation of a dynamic process of school reform. Ronfeldt et al (2015) conducted a large-scale quantitative study starting from explanatory factor analysis, which helped them to distinguish between various teacher collaborative activities. Their statistical data further revealed differences in teacher collaboration between schools and different impacts of collaboration on teachers' work contents. The quantitative research of Lee, Zhang and Yin (2011) on Hong Kong schools also began with exploratory factor analysis and pointed to three main structures of the PLC in the Hong Kong context: *shared and supportive leadership*, *collective learning and application*, and *supportive conditions (structures)*. Their study supported the positive effects of the PLC on teachers' collective efficacy and teachers' commitment to students.

As scholars attach more significance to teachers' experiences and meaning construction in learning, qualitative inquiries into how teachers develop knowledge through collaboration are increasing, including corpus analyses of the conversations in teacher collaborative meetings as well as observations and interviews on teacher collaboration (e.g., Horn et al., 2017; Patton & Parker, 2017; Scribner et al., 2007). Little (2002, 2003) expressed her concerns about the inadequacy of fine-grained analysis in understanding teachers' ordinary interactions and their daily work in communities. In her research, Little (2002) proposed an emerging analytical scheme that combined micro-ethnography with discourse

analysis to examine the flow of dialogue, potential learning resources, norms of interactions and development of practices in teachers' daily joint work, in order to discover micro-evidence in favor of locating teacher learning in teacher collaboration/ communities. Similar research orientations based on dialogue or conversations have been deepened by subsequent studies, for instance, Leko et al. (2015) categorized teachers' discourses according to the degree of inquiry tendency and knowledge integration of discourses, and found that discourses with high levels of these two dimensions can best promote learning in teachers' collaborative activities. An emphasis on teacher discourse highlights teacher's subjectivity, as experienced in collaboration:

> As in any stream of naturally occurring discourse, the teachers' talk serves as a principal resource in getting on with their work, while simultaneously reflecting and constructing the identities of and social relations among the teachers. The ongoing talk both conveys and constructs what it means to teach and to be a teacher, and to do so in this school, with these students and among these colleagues. (Little, 2003, p. 937)

Hao's (2015) is one of the few Chinese studies that have explored teacher collaboration using teacher narratives. His research found that the distinction of "major subject and minor subject" (p.17) status within schools leads to unequal status among teachers while the lack of meeting places and the heavy work of teachers in schools causes teachers' lack of willingness to communicate with colleagues, and also makes the interaction between teachers to observe and evaluate lessons become a burden rather than a favorable factor for teacher growth. The literature review by Lefstein et al. (2020) has pointed to gaps in the current research, that is, the modes of analysis applied to conversations in teacher groups are insufficient compared with the analysis of classroom discourses. Such modes of analysis also ignore the potential impacts of broader national and social contexts on teacher micro-interactions within schools. Rytivaara et al. (2019) studied teacher stories in their cross-case study on teacher co-teaching, and while their research does not illustrate a

theoretical foundation for using narrative inquiry, the teacher stories established a bridge between the school contexts of collaboration and the perceptions of individual teachers, which brings me to the place of stories in my own research on teacher collaboration.

Teacher Stories and Teacher Collaboration

Double-Story Structure: Inconsistent Stories

In the past two decades, many scholars have used teacher stories as a perspective or methodological means by which to explore teachers' knowledge development, practices and construction of teacher identities, admitting the crucial role of stories in supporting researchers in understanding teachers' lived experience, reflective practice and cultural contexts (Elbaz-Luwisch, 2001, 2006; Jenny, 2013; Norris, 2014). Elbaz-Luwisch (2001) has emphasized the potential of personal storytelling to defy cultural constraints in daily life, because such storytelling allows marginalized voices to claim their voices and memories, lest they be ignored or silenced in mainstream culture and narratives.

Crites (1979) first introduced the possibility of individuals' self-deception, which allowed at least two different or even conflicting scenarios to co-exist in consciousness. In the two scenarios, individuals tend to use the more acceptable one to suppress the one that is "unflattering or heart-breaking" (p.126). Crites (1979) called this process the "double-storied type of self-deception" (p.126-127), in which the scenario being suppressed is called *the real story*, and the one used to cover it up is referred to as *the cover story*. On this basis, Crites (1979) also proposed two other cases, one being a variation of the double-storied type, namely by using a negative cover story to inhibit the real story that is "too positive"; another possibility is to use a cover story to hide the fact that "there is no real story" (p.126-127). Clandinin and Connelly (1996) examined the tensions between school stories and teacher stories, and they used the metaphor of "conduit" (p. 25) to describe the tensions between theory and practice that teachers faced in the school. In their view, materials such as teaching theories, opinions of scholars, educational policy documents and rules are poured into teachers' practice through a *conduit*, forming the sacred stories about education. Teachers, on

the other hand, gain a safer and more private place in their classrooms to tell the secret stories that differ from those sacred ones, though their secret stories are often covered by the sacred stories.

Olson and Craig (2005) then introduced Crites' two-stories theory more explicitly to the field of teacher knowledge, further arguing that cover stories and real stories are always interdependent. Once a cover story exists, it *implies* a hidden real story. The status of the two stories – cover stories and real stories – is unbalanced. Cover stories have overwhelming power over real stories because they predate individuals, moreover in a more acceptable and authorized way. Whether or not the individual is aware of their existence, the individual has learned to tell the cover stories and consciously or unconsciously downplayed what they know (Olson & Craig, 2005).

It is worth noting, however, that Craig (1999) has pointed to the possibility of cover stories being helpful to beginning teachers. For beginning teachers, telling stories can be difficult in a school system, and cover stories may offer them the first authorized version of a teacher story to retell. As part of institutional narratives, cover stories set the parameters of "what is authorized to know" for beginning teachers (Craig, 1999, p. 408). Clandinin and Connelly (1996) also argued that school stories are a source of teachers' knowledge, and when teachers integrate institutional narratives into their personal stories, their knowledge, identities and teaching choices may change accordingly (Clandinin & Downer, 2009).

Another pair of inconsistent stories can arise from narrative inquirers' reflections on their research methodology. These scholars pay attention to teachers' interactive storytelling at a micro level in their daily life and put forward the concept of "small stories," namely those "real stories of lived lives" (Bamberg, 2004, p. 356) that people encounter in their daily life (Bamberg, 2004; Bamberg & Georgakopoulou, 2008). The "small stories" imply that stories are regarded as a means for individuals to interact in daily life and create characters in context, instead of the stories deliberately collected and organized by narrative inquirers out of preferences derived from their own research concerns (Bamberg & Georgakopoulou,

2008). Andrews (2004) has pointed to the tensions between counter-stories and master narratives (or dominant cultural narratives), seeing master narratives as the authority that gives people the norm and blueprint of life; by contrast, counter-stories are constructed individually or narrated by marginal groups, and are often grounded in resistance to dominant storylines. He further argues that counter-stories do not necessarily lead to people's marginalized position, but rather that people may own similar experiences of telling their individualized stories, consequently gaining a sense of belonging to the "outgroups" (p. 1). In Downey's research (2015), teachers countered cultural, institutional and local narratives by telling their *students'* stories; such stories were called "counterstories" (p. 1). Teachers' stories about their students reflect (and even construct) their sense and identity of being a teacher, and these counterstories have the potential to resist and reverse mainstream narratives about teachers' images (Downey, 2015).

As researchers identify the values of stories in realizing individuals' lives and the potential to resist more authoritative narratives can be found in these studies, I become more aware of the need to bring teachers' daily stories into research teacher collaboration. Teacher collaboration in China depends on the administrative structure of TRGs, while how it affects the daily life of teachers has not been fully discussed. Teachers' stories, as voices that may differ from the expectations of policy designers, may demonstrate teachers' more authentic experiences and feelings in collaboration. In the following part, I will review literature on both teacher collaboration and teacher stories in order to look for an academic position on which my research can stand.

Teacher Stories in Collaboration and of Collaboration

Little's (1990) explorations of teacher collaboration began with daily interactions among teachers and their colleagues in the workplace, emphasizing that the stories told by teachers are an "omnipresent feature of teacher's work lives" (p. 515). Two large-scale surveys in the United States have shown that among various forms of teacher collaboration, meetings and discussions with teachers of different levels of experience are more frequent,

while direct participation and observation of each other's teaching inside the classroom are less common (Johnston & Tiffany, 2018; MetLife Foundation, 2009). According to these studies, dialogue (both formal and informal) among teachers is the most accessible form for discovering and understanding teacher collaboration. Similar work with a focus on teachers' conversations in the workplace has been carried out by Horn and Little (2010), in which they suggest that during collaborative practice, teachers' conversations transformed from specific experiences (or stories) into general teaching principles. Therefore, storytelling can be a common way for teachers to expose difficulties and challenges in a group of teachers working *in* collaboration.

Referring to a series of studies by Craig and Olson (Craig, 1999, 2000; Olson & Craig, 2005) on the double-story structure, the basic assumption of my own research is that there are two types of teacher stories about collaboration: *teacher stories (in collaboration)* – the stories teachers tell during collaborative practice, and *stories of teacher collaboration* – the stories told about collaboration. The previous discussion of the double-story structure has hinted at the close connection and dynamic tension between the two stories, and this tension has to do with the relation between collaboration as a 'small' collective activity and the institutions on which it rests. For example, in Wenger's (1999) analysis of communities of practice, he argued that due to the ambiguity and negotiability inhering in communities of practice, the power of the institution to which the communities belong is always mediated by the productions of the communities. Wenger emphasized the inherent dynamics of a CoP and its potential to generate new meaning. Nonetheless, he also repeatedly warned against idealizing the inevitability of reform brought about by the CoP because a CoP can either resist or reproduce oppression (Wenger, 1999). When I use the double-storied structure to examine teacher collaboration, I need to be cognizant of the inherently oppressive relationship between cover and real stories; I also need to be aware of the different possibilities these (cover and real) stories present when teachers tell and retell them – teachers have the potential to both tell a challenging story that conflicts with existing

institutional narratives, and to repeat cover stories and thus sustain their ideological power during collaboration. My research will use narrative inquiry to examine how the collaboration of teachers in the context of China reflects a dynamic process of dialogue, even as I look at the impact of the tensions between cover stories and real stories on teacher hopes for curriculum improvement.

Chapter 3 – Methodology

Introduction

Viewing teacher collaboration as an educational practice that is endowed with meaning and interpretation by teachers themselves, I adopted a qualitative approach in this research (Denzin & Lincoln, 2018). Clandinin and Connelly (2000) argue that education is essentially a form of experience, thus should be understood and studied narratively. They have described the relationship between stories and human experience as follows:

> People shape their daily lives by stories of who they and others are and as they interpret their past in terms of these stories. Story, in the current idiom, is a portal through which a person enters the world and by which his or her experience of the world is interpreted and made personally meaningful. Viewed this way, narrative is the phenomena studied in inquiry. Narrative inquiry, the study of experience as story, then, is first and foremost a way of thinking about experience. Narrative inquiry as a methodology entails a view of the phenomena. To use narrative inquiry methodology is to adopt a particular view of experience as phenomena under study. (Connelly & Clandinin, 2006, p.477)

In this chapter, I discuss how narrative inquiry helped me explore the tension between individual and collective stories in Chinese teachers' collaboration. I also describe my methods of collecting and analyzing the teachers' narratives, and provide a context for my participants' social and teaching circumstances.

Narrative Inquiry

Narrative as Stance

Narrative inquiry as a method and a stance within the social sciences begins with discussion of narrative nature of human beings. For Polkinghorne (1988), "narrative is the fundamental scheme for linking individual human actions and events into interrelated aspects of an understandable composite" (p.13). MacIntyre's (2007) arguments echo this point of view, saying that "human life is composed of discrete actions which lead nowhere, which

have no order; the story-teller imposes on human events retrospectively an order which they did not have while they were lived" (p. 214). Telling stories is the process by which human beings construct or reconstruct their experience, giving "qualitative substance to the form of experience" (Crites, 1971, p. 296). Based on the assumption that humans live their lives in forms of story-telling, narrative inquiry is a research method for understanding human experience (Connelly & Clandinin, 2006).

Narrative is not merely about human beings; it can also form the foundation for exploring tensions between the individuals and the collective and of understanding the structures and flow of power. As claimed by Maines (1993) who proposed the narrative turn in sociology: "narratives are intrinsically collective acts and exist at any level of scale" (p. 32); in the moment when the individual tells her or his stories, what is also narrated is society. Plummer (1995) expands this argument further, believing that the process by which stories are produced, the way they are read and unfold, and the forms of their changes can be used to see into social orders and political dynamics.

In Plummer's (1995) research on sexual minorities, he argued with conviction that the telling or withholding of gay/lesbian stories is essentially a flow of power and negotiation; people only tell their stories when they feel safe in ceasing to be silent under a dominant patriarchal culture. This claim can be corroborated by Olson's detailed discussion of narrative authority. Olson (1995) articulated the inherent connections between individual experience, narrative, and knowledge. She draws on Bruner's view that there are two modes of knowing*:* *the paradigmatic mode of knowing* (de-contextualized knowledge and *the narrative mode of knowing* (contextualized knowledge). Paradigmatic knowing is more abstract; it denies the rationality of personal experience and is removed from contexts and is separated from the person – the knower. Narrative knowing holds that knowledge is constructed in experience and that individuals have the authority of knowledge by virtue of their authority over personal experience. Olson's discussion of the narrative mode of knowledge also argues that individuals must tell their own stories rather than live within the institutional narratives.

Thus, narrative inquiry researchers view narratives as the stories that individuals live, which reflect interpretations of their personal lives; they also tend to analyze narratives as a product of dominant cultural forces, so as to understand how individual experience is organized and valued by culture (Odette Wright, 2017). Given the close relationship between narrative and human life, narrative inquiry is an ideal methodological approach to use in the study of teacher collaboration in China. The method also allows me to explore the tension between the individual and the institution.

Narrative Inquiry and Teacher Research

In the field of teacher research, Clandinin and Connelly's narrative inquiry method takes John Dewey's viewpoint of *experience* as the core theoretical cornerstone and epistemological foundation (Clandinin & Connelly, 2000). They particularly draw on two characteristics of *experience* that Dewey spoke of – *interaction* and *continuity*. The notion of interaction emphasizes the connection between individual experience and social context. As Dewey argued:

> Because every experience is constituted by interaction between 'subject' and 'object,' between a self and its world, it is not itself either merely physical nor merely mental, no matter how much one factor or the other predominates. … In an experience, things and events belonging to the world, physical and social, are transformed through the human context they enter, while the live creature is changed and developed through its intercourse with things previously external to it. (Dewey, 1981, as cited in Clandinin and Rosiek, 2007, p. 39)

For its part, Dewey's notion of continuity, namely the notion that "experiences grow out of other experiences, and experiences lead to further experiences" (Clandinin & Connelly, 2000, p.2), inspired Clandinin and Connelly to focus on temporality in narrative inquiry, linking one with her historical experience and imagined future. Viewing teachers' experiences in this way, their actions cannot be mechanically understood as either promoting or hindering steps towards the realization of some objective educational goals; on Dewey's theory of

interaction, teachers' individual experiences and their understanding of education generate as well as structure new educational outcomes and the curriculum (Clandinin & Connelly, 2000).

Based on Dewey's philosophy of experience, Clandinin and Connelly introduced narrative inquiry as a method of researching teacher knowledge through teachers' storytelling. Connelly and Clandinin (1997) proposed the metaphor of "teachers' professional knowledge landscape" (p. 673), arguing that outside the classroom, teachers' experience, relationship and feelings interweave together so as to construct teachers' professional knowledge.

In my research, narrative inquiry inspired me not to isolate teachers' collaboration-related experience from prescribed collaboration goals and school culture but to instead explore how teacher collaboration became intertwined with various elements of their work contexts, exploring such matters (related to my research questions) as: for what practical needs did teachers feel motivated to collaborate? How did they perceive support or conflicts in collaboration, and how did those feelings change their practical orientations and choices? Narrative inquiry also allowed me to focus on the continuity of teachers' individual experiences so that the teachers' narratives about collaboration were not objectified representations of their collaborative practice; instead, the narratives are written in such a way as to show how each teacher continued or built on their previous beliefs and experiences when generating narratives, thus giving new meaning to their stories by their expectation or imagining of future collaboration.

Methods

Research Site

I chose the school “S” (pseudonym), a secondary school located in Sanjiang County in southwest China, as the research site for my research. Sanjiang County is affiliated to Liuzhou City, so that the education and teaching policies of S school are all affected by the policy documents of Liuzhou Education Bureau. Sanjiang County is a settlement of some ethnic minorities in China. It has 15 villages and 321,538 residents. Among the residents, the largest is the Dong ethnic minority, accounting for 58% of the county’s population (Sanjiang County Statistics Bureau, 2021). Since Sanjiang County is located in a mountainous area, it is suitable for the growth of crops such as green tea and glutinous rice. The planting and selling of tea is one of the economic pillars of Sanjiang. Some local teachers of S school also have their own farmland, so even though they work in semi-urbanized county, part of their lives remains pastoral.

Figure 2 The Tea Garden of Sanjiang County

Figure 2 shows the tea garden of Sanjiang, and Figure 3 is of a stone mural showing the culture of the Dong minority. The people images on the stone mural are wearing the costume of the Dong minority, and the totems behind them symbolize good wishes for agricultural production and fertility.

Figure 3 A Stone Mural of the Dong Minority

The S school is located in the center of Sanjiang County, but the homes of many teachers and students of the school are in the mountains with inconvenient transportation.

Figure 4 A Corner of the School Campus

Therefore, S school is a boarding school, providing dormitories for both teachers and students. More than half of the students live in the on-campus dormitories from Monday to Friday, and they go home by bus or by their parents on weekends. For teachers and students who live in school dormitories, the campus constitutes the entire scene of their school life. Figure 4 shows a corner of S school. The building on the left is the canteen. Students and teachers pay for a meal card to eat in the canteen; they can recharge their meal cards at an office on the first floor by cash or mobile phones. The buildings on the right are the dormitories. The teachers' dormitories are mainly on the first floor. Teachers who live not far from school choose to go home after work, but when they are busy or need to work overtime, they will spend the night in the dormitories. One teacher dormitory room can accommodate 1-2 teachers, while the student dormitory houses 8 people per room.

Figure 5 shows two teaching buildings of the S school. In Figure 5, the left and right teaching buildings are connected through the corridors in the middle of the figure, which are one of the characteristic architectural structures of the Dong minority. The whole school has four teaching buildings, and similar corridor structures appear between these four buildings. This structure is convenient for teachers and students in moving from classroom to classroom

Figure 5 Teaching Buildings of S School

in different buildings. It is worth mentioning that, as a secondary school located in a minority-inhabited region and as most of its students are Dong people, S school advocates the protection and development of minority cultures.

A set of pavilions in Figure 6 display the cultural characteristics of the Dong minority; the plaque reads “Clean and Honest Pavilion.” One wall of the pavilion shows some of the honors the S school has won in teaching and its protection of minority cultures. Since most settlements of the Dong people are near mountains and rivers, the people like to build pavilions in the mountains for climbers to rest temporarily (similar pavilions also appear in Figure 2); such a set of pavilions set up in S school also represent a cultural symbol of Dong people. The pavilions are also a place for students to rest after class.

Figure 6 A Set of Pavilions in S school

Participant Recruitment

In April 2021, with the permission of the principal of S School, I first contacted several volunteer teachers I knew from Liuzhou City, and sent my research design to them through social media, asking them to help me find teachers who were carrying out collaborative activities in S school and who would be willing to learn about the research. I

learned that some Chemistry teachers were conducting a collaboration-based research project; one of the urban volunteer teachers was also a Chemistry teacher. In May 2021, I went to S school to visit the Chemistry teacher (Liang). She was the first to express her willingness to be my research participant. With the help of Liang, using snowball sampling, I contacted eight other teachers in her Chemistry subject group. Four agreed to be my participants.

All five teacher participants belonged to the Chemistry Subject group of S School, and shared the same office. I received the principal's permission to stay in S School for one month, where I spent some time in the Chemistry teachers' office. I helped the teachers complete some of their work, which narrowed the distance between me and my participants, enhanced their trust in me, and made me more familiar with their working environment and teaching content.

Table 1 shows some basic information about the five participants, including their gender, years of teaching, majors in college or university, and their roles in teacher group(s). It should be noted that there were two intersecting "teacher groups" at the table. One was the "Chemistry Subject Group," which was composed of the 8 chemistry teachers in the school. The second was a "teacher research group." The research referred to a project called *A study on the use of mind maps for Chemistry Review Sessions* initiated by some of the Chemistry teachers of S school in 2020. In the data collection section and the Chapter 5 of this thesis, I will introduce the content of this research in more detail. Not all Chemistry teachers participated in this research project. Liang, for example, was not a member of the research group.

Table 1 Basic Information of the Five Participants

Pseudonym	**Gender**	**Position/Role in the group(s)**	**Years of Teaching**	**Major in College/University**
Lily	Female	Head of the research group	24	Chemistry
Ms. Liang	Female	The volunteer teacher from an urban secondary school; not a member of the research group	34	Biology
Keke	Female	No administrative title; member	5	Chemistry

		of the research group		
Yingzi	Female	Head of the chemistry subject group; member of the research group	15	Chemistry
Celine	Female	No administrative title; member of the research group	20	Biology and Chemistry

Locating Myself

Clandinin (2016) once argued that, as narrative inquirers, when we "tell our stories and listen to participants tell their stories in the inquiry, we … need to pay close attention to who we are in the inquiry and to understand that we are part of the storied landscapes we are studying. Thus, as inquirers, we are part of the present landscape and the past landscape, and we acknowledge that we helped to make the world in which we find ourselves" (p. 24), it was thus pivotal for me to think about who I was when I embarked on the research.

My living environment is Liuzhou City, with which Sanjiang County is affiliated. I have experienced most of my school years in that city's cultural context, so was unfamiliar with the life of Sanjiang County before I entered it. As a volunteer teacher from Liuzhou, Liang went through the same journey as me in walking into Sanjiang as a complete outsider, this four years ago. She developed her experience and understanding of local culture and school culture, so she often played the role of a guide in my research, helping me build a bridge between my city-living experiences and the local culture of Sanjiang. Therefore, I did not walk into the teachers' collaborative space empty-handed. My past life experience supported me. I became immersed in the geographical environment of S School but due to my own research needs, did not fully participate in its structure. Therefore, I regard myself as an insider walking on the edge of the school. This position helped me to relate with the teachers' experiences of school life, even as it also allowed me to distance myself at certain moments, and to constantly hover between my research questions and the site of teacher collaboration.

In composing field texts and research texts, I played the role of a collaborator with my

participants; the teachers' narratives presented in this thesis are the result of our co-composing. I was not an inviter of teachers' stories from the sidelines; by contrast, I appeared in the teachers' school life, and my interviews and dialogues become interwoven within their lived stories. In addition, my continuous thinking about the research questions also influenced my analysis of narrative. I was therefore in relationship with the teachers and with their stories, which affected how the teachers were written and presented in the thesis.

Data Collection

The First Source of Data: Observations. Narrative inquiry is a method that begins with the life experiences of both researcher and participants. Connelly and Clandinin (1991, 2006) have argued that narrative inquiry can contribute to a collaborative telling and retelling of individuals' stories, which calls for researchers' immersive observation, shared work with the participants and abundant fieldnotes of the participants' lived settings. Observation was therefore the first source of data for my study. Referring to the parallel story method of Craig (1999), the purpose of my observations was to understand the contexts in which teachers' stories were produced: the school context and the broader social and cultural context. Although the school context was not the focus of this research, it not only constituted the setting for the teachers' actions, but also provided institutional expectations for the teachers, making the teachers' practices subject to school norms and regulations (Craig, 1999).

When I entered S school, I made two kinds of observations: (1) Observations of teachers' work environment and daily interactions; (2) Observations of collaborative activities of the participating teachers. Firstly, with the permission of the school principal and participating teachers, I lived in the dormitory provided by the school for volunteer teachers, staying in the school 3-4 days a week for a month. I spent these days walking around the school, taking some photos of the school environment (such as those I provided in the *Research Site* section), and sometimes even kept the same schedule as the teachers so as to gain a felt experience about living *in* the school environment, rather than merely looking *on* as an outsider t (Connelly & Clandinin, 2006). I also spent some time in the teachers' office,

listening in on their day-to-day interactions (with permission), and sometimes I joined in to have small talk with them. The small talk referred to those "pleasant but unimportant" (Cochran-Smith & Lytle, 1993, p. 94) conversations that can happen among teachers. This process of observation in living with teachers and participating in their school life and the community, one not limited to a particular moment but extending throughout my research, allowed me not to "turn away from participants' lives and the life-composing" in which they were engaged (Clandinin, 2016, p. 51).

The second kind of observation I conducted was a series of targeted observations of teachers' collaboration, which, akin to cases, had specific boundaries of time, place and event, such as the beginning and end of a conversation. In this research, I observed six relatively complete teacher collaborative activities, including two teachers' open classes, two spontaneous teachers' collective discussions in the office, one formal meeting, and one experiment conducted by three teachers in a chemistry laboratory. Since some teachers who were not my participants were also involved, I only audio-recorded the activities of three participant teachers in the laboratory. Observing and participating in small talks, teachers' daily work in office and some of teachers' collaborative activities provided inspiration for my subsequent interviews with teachers, in which some teachers mentioned *my* existence in their stories.

The Second Source of Data: Interviews. I conducted two interviews with each participant. I first obtained a preliminary understanding of the collaboration-based research project in which my participants were participating through WeChat. In 2021, the Chemistry teachers in S school wanted to find a way of using mind maps in their Chemistry review sessions by means of a teacher research project, so they submitted their project plan and project application to S School. The school then submitted the application to Liuzhou Education Bureau, and the project was allowed to proceed. The formal name of their project was *A Study on the Use of Mind Maps for Chemistry Review Sessions*, and its members consisted of 11 Chemistry and Biology teachers from S School and one Chemistry teacher

from Liuzhou City. Among my participants, Lily, Celine, Keke and Yingzi were all members of this project, while Liang did not formally participate as she was a volunteer teacher.

Each of the two interviews with the teachers had a different focus. The purpose of the first interview was to understand the teacher's respective background stories of teaching in S school, their relevant experiences of participating in teacher collaboration in their school life, and the ways in which they understood the impact of teacher collaboration on their daily teaching. The second interview focused more on the teacher's participation in the collaboration-based research project, including their original motivation for joining the project and the project's impact on them. The interview design was also inspired by the "temporal and storied" characteristics of experience emphasized by Clandinin and Connelly (1994, p. 415). Across the two interviews, I try to find the *continuity* of the teachers' experience and narrative (in Dewey's sense), to see how their past experience become references for their current actions, and how their stories generated in the *present* point to tendencies of future practice. Therefore, during the second interview, I cited the stories told by them in the first interview many times, or drew inspiration from my observations of them, so as to seek for contextual echoes.

In addition, when interviewing a teacher, there could be the interactions between the teachers' narratives, such as one interviewee's response to a story told by another teacher, or her descriptions of other teachers related to the collaboration. As MacIntyre (2007) puts it, "correlative[s]" (p. 218) exist in the narrative, namely, a person might be involved in the stories of others, become a part of others' stories, and even generate dialogues and footnotes in others' stories. Such correlatives allowed me to use the one-on-one interviews to explore teachers' interactions in collaboration: How did they view the roles of their peers in collaboration? How did they see their impacts on others? A teacher's personal narrative did not mean that it only contained her own existence; this affected the way I wrote *Chapter 4 – Narrative Accounts*. In each teacher's narrative, I followed their stories in the mentioning of other teachers, demonstrating their interactions and relationships in collaboration.

The Third Source of Data: The Researcher's Field Notes and Journals. From the first day I entered S school, I wrote my research fieldnotes and journals every day, including writing on my laptop, writing in a paper notebook, or sometimes audio-recording my oral stories at the end of the day. What I recorded included a review of my observation notes for the day, my subjective feelings about the relationship between teachers, the interpersonal interactions I encountered, and the experience I felt of living in the school. The rationale for this kind of recording comes from Connelly and Clandinin's (2006) suggestion of the narrative inquirer's self-imagination as an "insider" (p. 484). I imagined myself living in S school like other teachers, walking in the corridors and pavilions with Dong ethnic customs. I imagined the teachers' moods when they were commuting to work, and also imagined the experience of living in Sanjiang County. In this kind of imagination, my field notes and journals resembled the results of a kind of self-interview (Connelly & Clandinin, 2006), but with no specific structure and content restrictions. In my subsequent narrative analysis, their status became as important as the transcripts of teachers' interviews. I shuttle back and forth between teachers' stories and my journals, looking for parallels and differences between my stories and teachers' stories, so as to enrich the details of teachers' life experiences.

Data Analysis and Representation

As mentioned earlier, the two interviews I conducted with each teacher had a slightly different focus. Each teacher's first interview was more about their past experience about being a teacher in S school and about their daily collaboration, while the second interview was closely related to the Chemistry teachers' research project. Therefore, the data analysis was divided into two phases. The first phase analyzed each teacher's own life story, which is mainly presented through the teachers' personal narrative records (in Chapter 4). The second phase consisted in the analysis of the teachers' research project as a case of teacher collaboration. In the second analysis, I do not separate the teachers' stories from one other, but instead analyze and present relevant teachers' stories based on the development process of the teachers' research project (in Chapter 5). Finally, the themes, characteristics and structures

emerging from the stories in Chapter 4 and 5 are integrated and discussed in Chapter 6. I next present the commonalities and differences in the methods used in the two phases of analysis.

Three Commonplaces in Narrative Inquiry. Connelly and Clandinin (2006) emphasized three commonplaces of narrative inquiry, namely, 1) *temporality*, 2) *sociality* and 3) *place*, which make narrative inquiry "the simultaneous exploration of all three" (p. 437). They also named these three commonplaces as the three-dimensional place of narrative inquiry (Clandinin & Connelly, 2000). The temporality means that the inquirer should pay attention to the continuity of experience, that is, current actions reflect historical clues and have the possibility to affect future actions. With this in mind, I focused on the temporal cues in teachers' narratives in my analysis process to see how they formed past events into a frame of reference for the present, and the present for the future. The second commonplace, sociality, emphasizes the social conditions of narratives, namely, "the milieu, the conditions under which people's experiences and events are unfolding" (Clandinin, 2013, p. 40). Sociality required me to focus on how teachers' narratives interact with the social environment, how their actions may be influenced by educational policies, and how the institutional structure of the school permeates their stories. I also needed to reflect on my relationship with my participants during analysis, how the teacher perceived our relationship, and whether our relationship formed a negotiation of meaning in the narrative (Connelly & Clandinin, 2006). The third commonplace, place, is crucial because "all events take place some place" (Connelly & Clandinin, 2006, p. 481). I have to pay attention to the places or locations where the events described in teacher stories arose, and how the places might shape teachers' lived experience and actions, constituting the boundaries of teacher practice.

According to Connelly and Clandinin (2006), the three commonplaces run through the whole process of narrative inquiry; they are part of the considerations that the researcher should always bear in mind. Therefore, the process of analyzing and interpreting field texts consists in placing them in a three-dimensional narrative inquiry space, narratively coding the texts and trying to answer the research questions (Clandinin & Connelly, 2000). The three

commonplaces provided enlightening questions for me to constantly think about during analysis. Next, I will turn to narrative analysis and explain the differences in two phases.

Phase 1: Plot-based Narrative Analysis. In the first phase of narrative analysis of teachers' daily school life and daily collaboration, I adopted a "plot-based" method. I borrowed the plot concept from Polkinghorne (1997), who defines the plot as "the narrative structure through which people understand and describe the relationship among the events and choices of their lives" (p.13). Polkinghorne (1997) concluded that plots have four functions in narratives; they 1) delimit a temporal range, 2) provide criteria for the selection of events to be included in the story, 3) temporally order events into an unfolding movement culminating in a conclusion, and 4) clarify or make explicit the meaning events have as contributors to the story. Narrative analysis is therefore a process by which the researcher looks for, selects and orders events from those texts that have not yet formed stories, and generates a story that can project particular conclusions based on research purposes (Polkinghorne, 1995). Based on this method, I searched my fieldnotes, journals and teachers' interview transcripts for temporal, contextual and historical clues by which the different events shared by the teachers could be connected. Ultimately, individuals' narrative accounts could demonstrate the ways in which teachers integrated collaboration-related stories into their lived stories in S school.

Phase 2: Story-based Coding Analysis. In my research, except for Liang, the four teachers all participated in a research project based on collaboration, as I mentioned above. I regarded the teachers' project as the key case of my research study, given my research questions. Therefore, the starting point, process and content of the teachers' project constituted the main structure of my analysis in the second stage. I conducted a cross-case narrative analysis of the teachers' stories under the theme of 'teachers' project.' I combined the coding method from grounded theory and used Nvivo 12 to analyze the narrative data of teachers from the second stage of interviews. However, different from analysis by way of "word-by-word, line-by-line, and incident-by-incident" as advocated by traditional grounded

theory analysis (Riessman, 2008, p.74), in the process of coding I instead kept intact the boundaries of the teacher narrative as much as possible, as encouraged by Riessman (2008). I did so by converting the interview transcripts into small story blocks semantically before coding them in Nvivo 12, for example by preserving the teachers' index of their own experience or a complete event they recounted. On the basis of these story blocks, I used Nvivo 12 to encode teachers' narratives according to their themes, so that each code reflected not a single word or expression, but a complete story.

Trustworthiness

The concept of validity does not apply in narrative inquiry in the same way as in quantitative research methods nor in qualitative research method, generally speaking (Webster, & Mertova, 2007). It is difficult for narrative inquiry to restore an absolute consistency with reality; instead, the trustworthiness of narrative inquiry comes from its presentation of "results that have the appearance of truth or reality" (Polkinghorne, 1988, p. 176). Based on this point of view, the quality of narrative itself helps to ensure the trustworthiness of my research. The three commonplaces of narrative inquiry proposed by Connelly and Clandinin (2006) helped me explore the interactivity and continuity of participants' experience. In the narrative accounts presented in this study, I verified or supplemented the narrative of an event with my field notes and the stories of different teachers, in order to ensure that these narratives did not stop at a certain time node, but had the possibility of interacting and reverberating with other events. As argued by Polkinghorne (1988):

> [I]t is the responsibility of researchers to establish a free flow of information from participants in their studies and to describe fully how it was accomplished. Narrative studies do not have formal proofs of reliability, relying instead on the details of their procedures to evoke an acceptance of the trustworthiness of the data. (p. 177)

Since the collection of data in narrative inquiry is deeply influenced by the contexts in which the stories emerge such as the time and space elements of the interviews

(Polkinghorne, 1988), I introduce the background of teachers' narratives when presenting each part of teachers' stories, and clearly demonstrate the existence of *me* as a researcher to the readers. Even after I left S school, I kept in touch with my participants through social media and phone calls. The need for our ongoing connection was evident whenever I wrote interim research texts (Clandinin & Connelly, 2000; Clandinin, 2006) or when I was inspired by an explanation of a phenomenon from the literature. I would contact my participants to confirm with them whether the texts and ideas I had written reflected their interpretations and the meanings they were trying to convey in their stories. This process helped to ensure the credibility and trustworthiness of the stories. In addition, these connections helped maintain the relationship between me and these teachers to this day, rather than coming to an abrupt end at the time when I left the field/school. The cultivating of this relationship enabled me to write research texts without distancing myself from the teachers too much, so that the stories I wrote could reflect the lived experiences of teachers as far as possible.

Chapter 4 – Narrative Accounts

On a wet rainy day, I walked into the corridor and put my umbrella away on the platform where other teachers also put their umbrellas. I walked into the offices of the Chemistry teachers. Teachers bowed their heads then went about their work – preparing a lesson, correcting a student's homework, or making a copy of a test that students had just taken. It was not strange for teachers to arrive late because of their lives, instead walking directly to their classes. When all the seats in the office were taken, the last teacher who walked in the office migh show surprise: "How come everyone is in here today?" Then the other teachers would smile and exchange pleasantries with her.

The conversations in the office connected teachers' personal lives with their teaching ones in the classroom. It was like a transaction among different stories, the result being that each teacher knew something about the students and lives of the other teachers. When a teacher complained, "That naughty student in my class got me into trouble again today," another teacher immediately understood who "that naughty student" was: "I know him. I can teach you a way to 'deal with him'..." Also, they exchanged items from home. A teacher's grandmother was making homemade desserts recently, and she would bring them to the office to share with other teachers. If another teacher who passed by the office came in, she would receive a piece of the desserts, and exclaim her satisfaction before she left: "This trip to your office really fed me!"

Characters and scenes like those presented in the above are what I observed during my one-month stay in S school. The life stories, teaching stories, and small talk of the group of county teachers I came into contact with were sometimes intertwined so closely that they formed the backdrop to their stories of collaboration. In this chapter, I use the plot-based analysis discussed in the chapter on Methodology, combined with Clandinin and Connelly's (2006) emphasis on the three commonplaces. I begin by telling the stories of how teachers came to S school – how they became teachers and how they appeared in the Chemistry office. In the first part of each teacher's narrative account, they describe their reasons and feelings

for coming to S school. Next, I invited them to review their past experiences of collaboration, and each teacher's unique definitions and meanings of collaboration emerged. At the end of each teacher's narrative, they talked about how collaboration formed part of their teaching experience, projecting their thoughts into future teaching practice.

Liang's Narrative Accounts

Ms. Liang was not the first teacher I interviewed; on the contrary, she was the last one. As the first teacher I was familiar with among my research participants, she and I both grew up in urban areas of southwest China – in other words, we were both *outsiders* to Sanjiang County. Since Liang was a volunteer teacher and had no fixed local residence, she and I both lived in the staff dormitory of S school. During my stay in Sanjiang, when night fell and most of Liang's work was over, I would walk with her on the school playground and talk about what we had seen in Sanjiang. Our communication made us seem like friends who forgot their respective ages. In my research, she became like a guide, enlightening me to notice and reflect on meaningful differences between urban and rural life. Therefore, I decided to start with Liang's narratives and then gradually invite each teacher's stories to the stage opened by my research so that their voices could be heard.

Building Friendships with Local Teachers began with eating together

As a teacher who had been working in a southwestern urban area for a long time, since 1988, Ms. Liang had already reached the legal retirement age when I started doing my research. However, she came to Sanjiang County to become a volunteer teacher out of her passion for educational practice, just to find a place where she could continue teaching. "I think I am still healthy now, so I want to keep teaching as long as I can," said Liang in a small talk with me. "The teachers in Sanjiang are pure, and I am happy to make friends with them, so it's also a way of enjoying life" (Fieldnotes-0607). By 'pure', she was referring to a perceived simplicity of colleague relationships – local teachers could become friends regardless of potential conflicts of interest.

Even though a "latecomer," Ms. Liang's integration into the county teacher

community was so fast and seamless that there were almost no gaps between being an urban teacher and living a township life. She attributed that smooth integration to the influence of her parents and her preference for county life. She began by sharing a metaphor her father used during her upbringing:

> [My] father was an old Communist Party member. Though I am not a party member, I was greatly influenced by him. 'We should act like a seed that takes root wherever it goes, and then sprouts and blossoms,' he usually said to me. My father's educational philosophy inspired me to get along well with local teachers and colleagues wherever I went. […] From the very beginning, I thought that since I came to Sanjiang, I wanted to fit in here [...] I wanted to do something here. (IVLB-0801-0348)

When she first came to Sanjiang in 2017, Liang felt frustrated because the school did not seem as much in need of help as she imagined:

> At that time, a group of our volunteer teachers from Liuzhou (the city in which the school where Liang used to work for a long time located) came to Sanjiang by intercity bus. The bus arrived at the gate, and the supervisor [of volunteer teachers] said, 'Liang, you are responsible for teaching in this school.' I got off the bus and saw that this school could not be regarded as a rural school. It looked similar to an urban school. I was unhappy. […] The bus had already left, but I stood at the school gate with my suitcase and called the supervisor, saying that I would not leave unless they took me to the countryside. The supervisor ignored me, then I thought, forget it, just do it. (IVLA-0703-0541)

Although Liang regretted not being able to teach in rural villages, it turned out that she put into practice her father's education – she was successfully accepted as a member of S school because of her respect for the local teachers' way of life and her meticulous observations:

[…] as soon as I came here, I felt the extraordinary friendliness of the teachers. They have the habit of eating oiled tea. […] they invited me to drink oiled tea kindly, so from then on, I gradually integrated into their lifestyle, and my relationship with them was getting progressively better […]. In my opinion, recognizing local teachers' lifestyles made the local teachers feel that I was identifiable and acceptable. They were also concerned about my daily diet […] and also warmly invited me to their homes in the countryside. So I thought it was easier to approach these teachers in terms of lifestyle so that I could receive the supports from the teachers and ultimately have an [positive] impact on my teaching. (IVLB-0801-0027)

Figure 7 Photograph of Sanjiang locals stir-frying oiled tea

Figure 8 Ingredients of oiled tea: peanuts, fried rice, fried small shrimps and so on

The oiled tea mentioned by Liang is the most famous food in Sanjiang County. To make oiled tea, local people would stir-fry certain locally grown tea leaves in an iron pot with

oil, pour water into the pot, boil it, and then serve (as shown in Figure 7). Oiled tea was usually served in bowls, being eaten with peanuts, glutinous rice dumplings and other ingredients (as shown in Figure 8). Therefore, the locals did not say "drink oiled tea" but "eat oiled tea."

Oiled tea was an indispensable side dish for Sanjiang locals to eat, whether dining in a formal restaurant or making dishes at home. Once a local teacher said to me or Liang, "Let's go eat oiled tea." She actually meant to invite us to dinner, which was a local way of expressing gratitude or establishing rapport. Liang discovered early on the close relationship between local people's way of interpersonal communications and eating oiled tea, so she shared the clue with me, who had just arrived in Sanjiang (Fieldnotes-0607).

Supporting local teachers: "To do something for them"

Liang's impression of S school did not stop at the moment she stepped off the bus, when she only saw the similarities between the school's facilities and those of the urban school where she worked before. She became keenly aware that local teachers were under-resourced in many ways, and that was where she could "do something" for Sanjiang teachers.

There was a time when Yingzi went to attend a lecture competition in Liuzhou. One part of the competition was "teaching without students" (*wushengshouke*), a common way for urban schools to recruit and evaluate teachers, which was strange to the county teachers. Liang, as a teacher with many years of teaching experience in the city, brought them useful information about the method of evaluation.

> [Sanjiang] teachers had never been to that kind of competition and had no chance to learn that (evaluation method) – they felt embarrassed to standing alone on the platform, in front of no students, to give a vague lecture. […] In order to help Yingzi, I contacted my colleague Ms. Hui (pseudonym) in Liuzhou. Hui participated in a provincial-level competition of teaching without students and won the first prize. I shared the video of the whole process of Hui's competition with Yingzi and told Yingzi about every specific part of the competition, so that she could have a model to

imitate. (IVLA-0703-0135)

Liang had her own judgment on the lack of experience of Sanjiang teachers, and she did not think that Sanjiang teachers should completely imitate or try to surpass the level of urban teachers:

> It's hard for [local teachers] to innovate in the competition. No one should make such demands. [I thought] what they needed was some experienced teachers to learn from … [so that they could learn] how that kind of competition was done. On that basis, they could improve their own teaching. (IVLA-0703-0200)

Liang was concerned about what she and urban teachers could offer Sanjiang teachers, not only in teaching but also in the leadership of the school. She once invited an administrative colleague in an urban school to share about her experience of management:

> The administrative leaders here worked very hard. […] they tried to physically inspect each floor of teaching buildings daily to know the situation of each grade and classroom. That was a bit taxing and inefficient. […] my former colleague Ms. Li (pseudonym) was good at managing a school; say, she would assign an administrative teacher to each grade or to a small group of classes, and several administrative teachers would report information to a superior leader. In that way, leaders could have more useful information in less time. I once invited Ms. Li to Sanjiang to give a speech on school management. (IVLA-0703-0743)

Liang was a careful observer and generous sharer. In her daily practice, she was fully aware of the gaps between urban and rural teachers and the lack of training support accessible to Sanjiang teachers. During four years of teaching in Sanjiang, in addition to fulfilling her duties as a local teacher, Liang also tried to build a bridge between urban and rural teachers.

Friendship as the basis of collaboration: "I always meet a group of friendly colleagues"

Liang was a Chemistry teacher whose subject in college was Biology. In Sanjiang, she shared an office with seven other teachers, all of whom were in Chemistry or Biology. Arranging teachers of the same subject in one office was quite common. Chemistry teachers

called themselves the “Chemistry Subject Group.” Similarly, other teachers in the school could be “Chinese Group teachers” or “a teacher belongs to the Chinese Subject Group.” In that way, teachers in S School had a community/group based on their subject matter. When I met other curious school staff on the road asking me friendly questions about my intention in coming to this school, Liang explained: “she (Yujie) is here to learn from teachers in the Chemistry Subject Group” (Fieldnotes-0608). From here, I realized that the teacher *group*(s) constructed the cognitive basis of other teachers in S school. Teachers know each other by identifying to which subject group other teachers belong. For Liang, her feelings towards the Chemistry Subject Group were positive and friendly; her next story will tell about that.

By eating oiled tea and sharing experiences with teachers at ordinary times, Liang had won the respect and love of teachers in the Chemistry Subject Group. Liang was not just a giver of knowledge. She also cherished the opportunity to learn from other teachers:

> Teachers around me were very motivated and talented. […] Once, I watched an open class of Celine. She assigned some exercises on the spot, selected some students’ wrong solution practices, projected them on the whiteboard, and then corrected and explained the students’ mistakes by drawing red lines on the screen (with an electronic pen) […] her methods were helpful for students […] I appreciated Celine’s well-organized teaching style; you will never forget which part of the textbook she was instructing. […] I listened to their classes and realized every teacher had something worth learning for me. (IVLA-0703-1327)

Liang said that she usually attended other teachers’ classes and observed them, not because of any mandatory requirements in the school, but because of the friendship among the teachers of the Chemistry Subject Group:

> Our teachers of the Chemistry Subject Group are very close to each other, and the atmosphere in the office is also extremely friendly. I feel really lucky that I always meet a group of friendly colleagues, we don’t have […] the so-called scheming phenomenon or the mutual exclusion among peer teachers at all […] They are a group

of responsive teachers. (IVLA-0703-1120)

Liang also provided some examples of how strong the friendship between those teachers was; for example, they usually travelled to the same place during the holidays, they would spontaneously offer support and share the pressure when a teacher was going to participate in a competition. Those frequent interactions, inside or outside the school, laid a solid foundation for the collaboration of the Chemistry Subject Group teachers.

> We all knew that if there were conflicting opinions when discussing issues in the office, people would not hide their true feelings for the sake of seeming harmony. […] as I said just now, our Chemistry teachers were always responsive and ready to help; even if you just had a small question, someone would answer. […] Maybe because of our close relationship, we all spoke bluntly about teaching questions or student issues without euphemisms. It also made our communication more effective. Even though we may disagree on a particular point of view, it really didn't affect our friendships in private. […] It was a fortunate part of my career. (IVLA-0703-1457)

Friendships allowed the Chemistry teachers to be candid in the way they offered their opinions to each other. Nonetheless, Liang pointed out an interesting "clique phenomenon" that made teachers less likely to be as outspoken as they used to be when they were outside their groups:

> When we were in our own office, with our *own people* (zijiren, people who can be regarded as belonging to one's own group) around, for sure we could speak plainly. […] As it came to a school-level lecture competition or performance, we were less likely to point out their deficiencies. Because […] every teacher … had worked hard to prepare […] not only themselves but the team/group behind them all prepared for the competition; if we (who were estranged from the teacher presenting) pointed out the shortcomings […], they would feel frustrated. […] If I wanted to give some advice, I usually encouraged the teacher by giving her five or six points that she had done well, and then one or two things that she could improve. (IVLB-0801-0935)

When Liang looked at a teacher who was demonstrating her teaching skills, what Liang saw was not the individual teacher's work, but the whole group behind her:

> I don't think that withholding feedback in this kind of presentation will hinder the teacher's growth. She (the teacher presenting) must have her group of teachers and a designated instructor who would privately point out her shortcomings after the competition or the presentation. It doesn't matter that we outsiders don't provide enough opinions. There would always be someone to let her know (how to improve). (IVLB-0801-1144)

In this sense, subject-based teacher groups formed the basis for Sanjiang teachers' collaboration. Liang's judgement about whether she could be frank about her ideas was based on her degree of proximity or distance from the group to which a teacher belonged.

The school's role in collaboration: a name for collaboration, not a source of support

In the early 2000s, even teachers in urban areas of southwestern China had little opportunity to engage in well-established research-oriented activities. Fortunately, at the end of the 20th century, two chemistry researchers in Liuzhou initiated several educational research projects, with which Liang became involved:

> In the past (around 2000), teaching research projects had to be initiated by researchers at the local Institute of Education Science. […] there were two pioneering researchers of our Chemistry subject in the institute who launched some research projects […] Chemistry teachers from all over Liuzhou City could sign up for those projects, and I signed up, so I had the experience of participating in educational research projects very early. […] What impressed me most was the first research project I participated in. It aimed at letting our teachers know that we should not treat all students with only one standard. Students were not like accessories in a factory, which were stipulated to be ten centimetres long and could neither be eleven nor nine centimetres. Students were far more diverse. […] After participating in that project, I began to be more tolerant of my students and appropriately lower my expectations for those with

weaker learning abilities. I think the project was helpful for me and also benefited my students.

I noticed that in her teaching, Liang tried to remember the behavioural characteristics of each of her students. Once, a student was two minutes late for class and met Liang standing at the classroom door. Instead of criticizing the student, Liang just told him, "It's not a good habit for you to be late all the time. But you are only two minutes late this time, compared to your usual five minutes late, it's an improvement. Can you let me see you come in on time when the bell rings next time?" (Fieldnotes-0615) This episode provides evidence that Liang's teaching practice matches the teaching beliefs she had learned from her previous research project – she paid attention to the individuality and differentiated needs of her students, and adjusted her strategies accordingly.

When Liang worked in the urban school, the leaders attached great importance to teachers' professional development and teacher collaboration. She recalled that when one of her colleagues prepared for a teaching competition, the department leaders and the principal attended the teaching rehearsals twice and provided various suggestions. However, in Sanjiang, even though some teaching research projects was initiated in the name of the school, teachers rarely obtained significant support from the school:

> Here in Sanjiang, I rarely saw the [S] school leader providing information to teachers. Luckier teachers could rely on their connections to find some experienced experts for guidance; those teachers who couldn't find such experts had to search the internet for information by themselves slowly, and the improvement they could get from the collaboration was limited. (IVLA-0703-2651)

Liang's urban teacher's identity allowed her to observe (and participate in) teacher collaboration in Sanjiang with a comparative perspective, and her comments were also full of pity for local teachers' current situation of limited resources. Even if Liang's stories end temporarily in this section, we can still see her constantly in the narratives of other teachers that follow.

Keke's Narrative Accounts

When I nervously entered the office room of the group of teachers, Keke's presence relieved me a little. She was the youngest of the teachers, so I felt a sense of familiarity and closeness because of our similarities in age. Even though her 5-year teaching experience was the least among her colleagues in the same subject, Keke's connection to the school could be dated back to her own junior high school days. Keke was not a native of Sanjiang, but with the change in her parents' work, she finally came to S school. At that time, some older teachers such as Lily taught her some courses, which made Keke get along well with her colleagues soon after she became a teacher.

Keke, however, did not attribute her eventual choice to come to the school as a teacher to this early experience, but rather as a *step-by-step* process of her self-growth:

> I became a teacher step-by-step. I did not suddenly decide to be a teacher at any particular moment […] When I graduated from high school, my teachers suggested I could go to a college that trains teachers, and I took that advice. […] I thought I was doing well in college, so I applied for a teaching job after graduation. […] I wanted to go back to my hometown to teach, and it happened that the S school was looking for chemistry teachers, so I came here. (IVKA-0609-0204)

As Keke said, there was no sudden or pivotal event that made her commit to a teaching profession. She described her career choice as a natural consequence of conforming to certain stereotyped gender norms — "women are fit to be teachers" (IVKA-0609-0445) — and the consequence of her college education. However, as our conversations unfolded, Keke's deep reflection on teaching and thoughtful focus on her students revealed a modest ambition.

Keke's Teaching Puzzles and Beliefs: A Focus on Students

Keke talked about her initial doubts in teaching and the mentors who gave her courage and direction. Before becoming a formal teacher, Keke did not think that she was good at dealing with students and their parents, so she felt intimidated by the potential

conflicts that communicating with parents might bring. However, when she started the internship in her college, two teachers close to her age served as her instructors. One of them was responsible for teaching her the subject knowledge necessary for her Chemistry class, and the other was an experienced administrative teacher who shared the skills and experience she needed to be a good classroom teacher. As Keke said:

> Although they were only two years older than me, they were unique in teaching and handling relationships with students. […] I especially learned some skills in communicating with students from the administrative teacher. For example, if students are noisy in class, I should not ask them to behave well, but I can deliberately select some student role models to praise and let the rest know what behaviours are valued in the classroom. The techniques she taught me were simple and practical. […] I started to believe that if my instructors could do the teacher's work well, I could do it too. (IVKA-0609-0447)

Keke's worries during her internship and the two instructors she was assigned constituted a small microcosm of the *professionalism* of teachers in China's compulsory education stage: the demarcation between teachers' teaching tasks of their subjects and tasks of student management knowledge requires Chinese pre-service education to provide teachers with two kinds of professional qualities. Like most of her colleagues, Keke had a role other than a Chemistry teacher in the school – the class teacher (*banzhuren*) – an identity unique to the Chinese education system. The class teacher can be understood as an advisor of a class of students (usually about 40-60 students). The content of a class teacher's work includes moral education for students, building class culture, promoting students' collaboration, and becoming a bridge between students' parents and the school (Liu et al., 2018). In addition, due to the boarding nature of rural schools, the class teachers of Keke's school in Sanjiang are also responsible for observing and recording students' daily life and their psychological conditions during their stay on campus.

As early as 2006, the Ministry of Education of China confirmed that the work of class

teachers must be an essential part of the work of primary and secondary teachers, and further stipulated that class teachers are responsible for ideological education of students and managing the class as a collectivity (Ministry of Education, 2006). Consequently, learning to comprehensively know and manage students has become part of pre-service training for teachers like Keke. Managing students and subject teaching were therefore intertwined in Keke's day-to-day work, sometimes inextricably:

> I recently encountered a bottleneck in my teaching. The students [in my class] are neither excellent nor the kind of students who will learn consciously and actively. Most of them need the guidance of teachers all the time. But as a teacher, I do not have enough energy to guide my students every day […] so I felt negative some time ago. […] Another problem was that now that the students are about to take the final exam, I have to spend more time helping them pass it. Since the students [in my class] are polarized in terms of grades, I need to make corresponding study plans … such as selecting difficult questions for students with good foundations, simple questions for students with poor grades so that all of my students might be improved in their scores. [However,] the students did not like to practice the questions, especially the students with poor grades who were inclined to give up, so I had to supervise those students. There was more than one such student in my class, so I was drained and even dejected at that time. […] I felt that I had paid a lot but did not have a good effect on my students' performance. (IVKA-0609-0706)

When Keke recounted those difficulties, she repeatedly described the characteristics of "students in her class" to me, which was also a large proportion of her daily conversations with me outside our interviews. She often invited students who were not performing well in class or who had been anxious to the office to talk. I could feel that as a class teacher, she had a strong self-standard: she must be familiar with the characteristics of her students. Therefore, her planned work was always focused on her students' needs.

In the above story, Keke's confusion was not merely about the subject she was

teaching – she never even mentioned the specific subject knowledge – but her observations and concerns about her students' exam preparation from the perspective of a class teacher. As she told me in a small talk: "The class teacher must be very familiar with her students so that she can communicate with teachers of other subjects" (Fieldnotes-0615). Keke also incorporated her student-centered beliefs into her subject teaching: "I don't think there is a universal definition of a good teacher, but I have to be strong in the subject I teach. Only if I am strong in my subject knowledge will I have the confidence to pass it on to my students, and they will accept my instructions, convincedly" (IVKA-0609-0556).

Subject Teaching and Teachers' Mutual Assistance

Keke's first difficulty in subject teaching when she entered the school was related to the chronological order in which the two subjects, Biology and Chemistry, appeared in the secondary school textbooks. In most regions of China, there are three academic years of secondary school, in which students spend the first two years studying Geography and Biology. Then students take the combined exam (*huikao*) of the two subjects before entering the third grade of secondary school. After the combined exam, they will not learn any biology and geography knowledge; the Chemistry subject will appear in the textbooks. Students will spend a year studying Chemistry and take the high school entrance exam (*zhongkao*) at the end of the third year. Chemistry is one of the subjects in the high school entrance exam, along with Chinese and Math.

Due to the scarcity of rural teachers and the overlap in knowledge between the two subjects, in the Sanjiang School, whether teachers studied Biology or Chemistry in college, they had to serve as the teachers of both. If teachers were to teach the same group of students from the first year to the third year, they would teach Biology for the previous two years, and then in the third year, start teaching Chemistry. Once teachers are instructing classes of different grades, it is common for them to teach the two subjects in the same year. For Keke who studied Chemistry in college, she was faced with the situation of teaching Biology as soon as she joined the job; that was where she needed support the most:

> I didn't study Biology but Chemistry during college, but when I first came to the school, [the school leaders] assigned me to teach Biology subjects. There was much knowledge I didn't understand and questions in the exercises that I had never met, so I had to read through the textbooks and teachers' guide books before explaining knowledge to my students. […] After doing all official papers and mock questions in recent years, my biology knowledge was finally solid. (IVKA-0609-1001)

Although Keke tackled the teaching challenges she faced early in her career in a relatively independent manner, she felt rusty in Chemistry because she had been teaching Biology for years: "I didn't start taking Chemistry class until the fifth year of my work, which caused a long period of stagnation in my teaching of Chemistry, and I had to look up to all kinds of teaching aids again" (IVKA-0609-1143).

This time, things were a bit different. Keke's solution was no longer limited to searching for information on her own, but she began to seek help from teachers in the same office as her: "In order to familiarize myself with the Chemistry teaching methods and some exam question types, I not only went to the teaching assistants but also consulted colleagues like Celine, Liang and Lily when I failed to work out a question" (IVKA-0609-1203).

Keke's way of "consulting colleagues" could be a casual way of interacting with other teachers in their everyday conversations. Whether it was a shared educational goal or an individual teacher's serendipitous doubts, it could provide an occasion for Keke and other teachers to communicate with each other:

> You were there last time, too, right? Mr. Cao (pseudonym) asked me a question about the biology exam. In fact, he was at the same time asking other teachers in the office. Everyone immediately stated the relevant knowledge points that they knew or immediately helped to find information […] we started a collective discussion and finally got a reasonable answer. That was what our office is like. As long as there are people in the office, [and] as long as you raise a question on the spot, other people will be willing to tell you everything they know. (IVKA-0609-1432)

Coincidentally, I was also there for the sudden and random discussion that Keke described. It was an exciting conversation. A teacher in the office, Mr. Cao, found very strange a question from a test about "whether capillaries are cells" because there was no related definitions in the textbook. Cao called Keke's name and asked her if she knew how to understand the question, and as Keke said, even if Cao did not ask other teachers for help, other teachers also voluntarily joined into the discussion. As I opened my mobile browser to search for the answer to "whether capillaries are cells," a fierce discussion erupted. Teachers found that the definitions of capillaries were ambiguous in the textbooks. In other words, they felt that the question was beyond the scope of the Biology class at the secondary students' level. In the end, Liang summarized that the design of the question was unreasonable and that their students only needed to be familiar with the role of capillaries in the human body, without the need for strict distinction between capillaries, cells and epidermic cells (Fieldnotes-0607).

The discussion, recorded by Keke's account as well as noted in my fieldnotes, was a kind of brainstorm that turned out to be not uncommon in the Chemistry office. It was often caused by a teacher who stumbled upon confusion in teaching and randomly threw her/his questions around the office, and other teachers in the office would actively answer it. Even though the discussion was occasional and unpredictable, the results were often to the satisfaction of teachers. According to Keke, the reason why such discussions could occur frequently was because of a mutual understanding among the teachers in the office:

> We are a group of people willing to share their outcomes. For example, I used certain teaching material for a class. […] After I finished the class, I thought my students' response was satisfying, then I would take [the material] to the office and shared it with others. [I remember that] Celine also came across review material targeted at difficult questions, so she asked other teachers if they needed it; we all thought it was good, so she printed the material and sent it to each of us. (IVK-A0609-1432)

Keke conveyed her trust in the office and was proud and satisfied with an atmosphere

in which she could ask questions and always get responses: “You [can] see that there are a lot of printed documents. They are the results of our sharing with each other. I think it is a way of communication and collaboration, a win-win situation, right?” (IVKA-0609-1602)

Keke’s beliefs in collaboration: “Teachers cannot fight alone”

Beyond the daily mutual aids in the office, Keke shared two stories of her collaboration with other teachers. In her first story, a young teacher was preparing for a teaching competition, and the other teachers supported his preparation process with a reasonable division of labour. Lily served as the teacher’s tutor while the other teachers looked on, providing suggestions based on their own teaching strategies:

> The division was fair, no one did too much or too little, and no one complained that it was an extra task. […] Lily was [the young teacher’s] tutor, so she took the main position to guide him […] we other teachers were present and put forward some suggestions on the spot […] Lily’s suggestions were more focused on his teaching strategies and contents, say, which knowledge block was more important in the textbook, and which knowledge requires more instructions. [In this way,] all of our teachers learned a lot on how to take similar type of course. (IVKA-0609-1301)

What Keke described as “a reasonable division of labour” during the collaboration for the teacher’s teaching rehearsal did not refer to a strict and well-defined assigned work (only Lily had a clear role as an instructor), but that each teacher could give opinions based on her/his expertise in the open suggestion section:

> In terms of subject knowledge, I may not be as professional as Celine and Lily, and I can’t react as quickly [in this respect …] but younger teachers like me are also skilled at enlivening the classroom. I have given other teachers advice on motivating students […] I’m also relatively good at using interactive whiteboards, so I share my tips with other teachers. (IVKA-0609-2316)

In another story about collaboration shared by Keke, she made it clear that she recognized the value of teacher collaboration not only in the sharing of different teaching

skills among teachers, but in "allowing teachers to see each other." It was a case of teacher collaboration around the Geography and Biology combined exam that the second graders were about to take:

> The students [in the second grade] were about to take the [combined] exam, so we [Biology teachers] needed to have a discussion with the Geography teachers to determine the key strategies before the exam so that we could combine the two subjects during the review stage and see how our students are doing, rather than focusing on students' performance of our own subjects. (IVKA-0609-1808)

Geography and Biology, two subjects that rarely intrinsically intersect in terms of subject content, required joint discussion by teachers because, in the combined exam those students were about to take, the two subjects were jointly assessed and given *one* rating rather than being given separate scores of each subject:

> The main purpose of our collaboration was to increase students' probability of getting the highest total score (A+) on the combined exam. Some students might be better at Geography, and some might be better at Biology, but that alone would not necessarily lead to an excellent score on the combined exam. [Therefore,] we [teachers of the two subjects] must discuss it. Besides, the Geography teachers' office was far away from ours, […] located on the other side of the teaching building. If we did not designate a time and place to discuss this, we might not meet each other at ordinary times. Therefore, only by meeting and discussing can we see each other and know what should be the focus of our efforts. (IVKA-0609-1830)

Keke described how the distance between the two subjects' offices made it impossible for teachers to "see" each other under normal circumstances. It was not just about visibility in a visual sense but also a perspective from which teachers gain advice, like Keke's sense of trust in her own office:

> *Teachers cannot fight alone.* If I could only rely on myself in teaching, I would have no way of knowing where my deficiencies lie. The students are not equipped with the

> knowledge of teaching, so even if they find that I am not doing well in some areas, they can't tell me how to improve. Therefore, I believe that teacher collaboration is beneficial. […] Only experienced teachers can *see my teaching problems* and know how to improve my organization of teaching language and my way of interacting with students. (IVKA-0609-2426; emphasis added)

Moreover, teachers' willingness to help each other had become a source of consensus between Keke and other teachers, thus teachers' mutual assistance could happen outside the office as well: "Even if we don't sit down to discuss, any time I find myself encountering a problem, I will ask one I think is more qualified than me for help, even if she is not in the office. I will send a WeChat message to consult her; otherwise, it would be uncomfortable to keep those questions [but not solve them], [it feels] like there is a pimple in my heart. […] And I know that other teachers also value teaching, so they will definitely be willing to help me." (IVK-A0609-2800)

In Keke's stories, the teacher group(s) provided her with a reference point for her introspection and created the supportive environment necessary for her to teach. Even though she did not always rely on other teachers, when she encountered teaching problems that she could not solve independently, the mutual trust among the teacher group allowed her the opportunity to interact and communicate with other teachers, so that her private teaching problems could be discussed in a more public environment. This was an important way for her to improve herself.

Celine's Narrative Accounts

Celine was the second teacher I interviewed after Keke. She was a teacher with twenty years of teaching experience, quick-witted and always straightforward. When I first started communicating with her, she left me with the impression of being assertive and judicious. As her stories unfolded, I saw an image of a rural teacher with a distinct character who always pursued progress.

The Chance to Come to Sanjiang

Celine was born in Sanjiang and grew up there. She took the college entrance examination in 1999 and chose to study at Liuzhou Teachers College because of a reason similar to Keke's – "girls are suitable for being teachers"; she majored in Biology and Chemistry. Celine's parents both worked as teachers, though they went on to careers unrelated to education, in Celine's view, her parents "had a predestined relationship with being a teacher." Parents' teaching experience gave Celine a sense of closeness to teaching

> I didn't have that feeling [of wanting to be a teacher] when I was a child. Some adults occasionally asked me: 'What do you want to be when you grow up?' I couldn't answer them, but I only knew that mom and dad had been teachers, so there was a flash of thought: teaching may be a promising career. Then I was about to go to college; I filled out my application with that thought. As a woman, a teaching job would suit me […] and a teacher's working environment would be good." (IVCA-0614-0244)

With an affinity for teaching and the familiarity of living in Sanjiang, Celine soon decided to return to the familiar place after graduating from the college. Celine first worked in a rural school located in a small village affiliated to Sanjiang County for 15 years, and when she started a family and gave birth to her daughter, she realized that she needed to move to the more urbanized Sanjiang County so that her daughter could have a better education environment. Switching from a rural school to S school brought some changes to her job conditions. Since there was no longer a subsidy provided by the rural government, her salary decreased; it had only gradually risen in recent years. However, the most marked change for Celine did not come from the change in her salary, but from the working environment of the school. As she said:

> I have always been a serious and responsible person. As long as I decide to do a thing, I will do it the best. […] but when I taught in the village, it was no different if I worked hard or not. I was muddling along without getting recognition and affirmation from others. […] there was a boy who often disturbed the order of my classes […] I

> wanted to communicate with his parents [about his performance]. Instead of thoughtfully responding to me, they [the boy's parents] vaguely expressed that I was not qualified to teach their child and blamed me. [Then] I thought it was pointless to take teaching too seriously, so there was a period when I lowered my standards. […] After I came to the county seat (Sanjiang), I saw all the teachers in my office working hard in preparing lessons. You can see that even at such an old age as Mr. Cao (about fifty years old), he still thought over every question he would explain before class. […] Ms. Liang is also my idol. She went to the classroom to accompany her students at 6:30 in the morning [...] I thought I was early enough at seven but was not as good as her. […] now I'm also trying to get to the office at 6:30. […] I am happy and grateful to have them as my colleagues because of the positive impacts they had on me. I don't regret moving to the county. (IVCA-0614-1942)

Viewing herself as a conscientious and responsible teacher, what Celine remembered most about the changes brought about by the transition from a rural school to the S school were the differences in her colleagues and the Chemistry subject group's atmosphere of emphasis on teaching. She went from a work environment where she was merely "muddling along" to an office where her colleagues were actively involved in teaching, which satisfied her and inspired her sense of enterprise. The internal drive for continuous career development ran through the stories of Celine, which also influenced her reflections on the teacher collaboration that she participated in S school.

Insufficient supports: "I look forward to a better partnership"

As Celine put it, she was someone who had high standards for herself but also expected to have a supportive environment and a group of equally conscientious colleagues. Celine recounted a story about how she co-worked with Yingzi to support Lily in a video-recording lecture competition. Most teachers in the Chemistry Subject Group had participated in some lecture competitions in that semester, but Lily had not, so the motivation of the collaboration that Celine and Yingzi hoped to help Lily win some teaching awards. As

recounted by Celine: “We decided to help her participate in another class-recording competition and to win the prize from the county” (IVCA-0614-1203).

In general, information about teaching competitions will be announced by the school, but unexpectedly, at that time S school did not publicly publish news on the usual bulletin board, which turned information into inside news known only to some staff. Consequently, Lily did not receive timely information about this competition. Celine accidentally got the news about the deadline of the competition from other colleagues, so she immediately shared this information with Lily and reminded her to record a video as soon as possible, so as to garner the opportunity to improve her professional title.

Participating in various teaching competitions and research-oriented activities as much as possible is a necessary journey for Chinese primary and secondary school teachers to obtain higher professional titles. Consequently, for rural teachers who have less access to information about these competitions than their urban counterparts, finding ways to engage in these activities to win prizes has become a regular part of their job (Xu, 2021). Therefore, Celine’s action of sharing information about the video-recording class competition that was still inviting participants could be regarded as *the beginning of the collaboration* between Celine, Lily and Yingzi:

> The theme of the competition was to ask teachers to find a Chemistry experiment worth improving [from the textbook]. […] I flipped through the textbook and searched the Internet overnight. I found that the experiment ‘producing oxygen in the laboratory’ was feasible because we can obtain different experimental results by changing oxygen catalysts. But Lily chose the experiment of ‘producing carbon dioxide in the laboratory’ and had already written her lesson plan, and I did not disturb her by putting forward my ideas. […] then I checked some videos of the nationwide teaching competition and noticed that a teacher held some test tubes at the same time and poured the reagents into other test tubes. I had never seen that operation before, and I supposed it might be an innovative approach, so I suggested

> Lily try it. She followed [my advice] and recorded her class. However, when Ms. Liang saw the video we recorded, she pointed out our approach was wrong. […] she said that holding several test tubes together would easily cause contamination of the chemical reagents and was not conforming to laboratory specifications […] We should have avoided these mistakes. (IVCA-0614-1736)

Celine was slightly embarrassed when telling the story, because she realized that the "innovative" way of pouring the chemical reagents that she thought would help Lily perform well in the recording competition was professionally wrong. The small mistake was partly caused by her trust in higher-level information channels (competitors in the national competition) and the inefficiency in obtaining valid information from her peers around her. As analyzed by Xu (2021), township and countryside Chinese teachers who are in a disadvantaged position of social capital are inclined to rely on knowledge authorities in their actions. In the following account, Celine also explained why she still felt a lack of "deep communication" in her collaboration with other teachers though her colleagues were more responsible than those in the countryside.

> As a teacher of both Chemistry and Biology, my pressure was high. I had to explore how to break through the difficulties in teaching or make my students understand the knowledge better, but no one could help me figure them out, whether in the countryside or the county school. [The reason of my dilemma] must not be that [my colleagues] are unwilling to help me, but they cannot help me. […] my colleagues supported each other, say, if I lost my teaching aids, they would find them for me; but *there was no deep communication about our teaching methods.* [For example,] when I took part in a lecture contest in Liuzhou some time ago, my original idea was that I would like to voice my thoughts in the office, then others could find my shortcomings and help me revise them. But everyone was busy with their work and could not participate in the discussion wholeheartedly, so I thought the collaboration here was relatively weak. Everyone was too busy to help each other. (IVCA-0614-0650;

emphasis added)

Celine made a clear distinction between the shallow level of mutual support between colleagues (sharing materials and teaching aids) and the deep level of collective professional growth (helping her develop teaching knowledge), so she judged what kind of help she needed in her professional development and where she could find it:

> Here (in Sanjiang), I can't find anyone who can really guide me. If I have a key question to ask, I will call one of my college classmates working in Liuzhou City. She once shared her training experience and learning materials in the city with me. I am envious that she could access good learning opportunities in the city, and I could see that her level had improved, which makes me want to get closer to her status. (IVCA-0614-1854)

Witnessing and experiencing the different working environments of teachers from the village, the county, and the city, Celine realized that her needs for professional development were not being answered. "In the village, I hardly had any interaction with others. There were only me and another Chemistry teacher in total, and we didn't usually talk much. Sanjiang is better than the village, at least we communicate in the office. […] but I don't think it's as collaborative as in the city, which is so intense and has a sense of teamwork. I look forward to a better partnership" (IVCA-0614-1920).

Inadequate collaboration: "I wanted to be blunt"

"Some big public collaborative activities are formalistic, and I can't adequately express myself." Celine divided the collaborative activities in which she had participated into two categories. One was the formal collaboration organized by the school or an official department; the other was the private teacher mutual assistance in which she spontaneously consulted other teachers when she encountered a teaching problem:

> In private, if that's what you call collaboration when I raise an issue in the office, I am ready to be criticized and pointed out that I didn't understand the problem properly, so other teachers will speak up; similarly, if someone else asks a question in the office,

she should know that her statements are to be corrected, so I can also fully express my thoughts. (IVCA-0614-2238)

The informal collaboration that Celine talked about, or the *informal workplace interactions of teachers* (Huang & Wang, 2021), have been proven to be positively associated with both the individual teacher's learning and the collaborative culture in school (Grosemans et al., 2015; Huang & Wang, 2021). In contrast, the "formal collaboration" did not meet Celine's expectations because, in her words, "*those events were not a place for honest conversations*" (emphasis added). She explained further:

> […] in those [big events], everything is set up – for example, in an open class, a teacher comes up to show her class, other teachers speak 'freely,' and then the graders make comments, these are the three set-up sessions. I found that in that kind of activity, although the teacher would say, 'please point out my shortcomings,' no one dared to point them out. […] I felt like it would be embarrassing to criticize her too much. It was like she just went through the process (of inviting feedback) but didn't really expect us to correct her. […] I don't think these events were a place for honest communication. They were more official and my participation in them was superficial. […] in my office, we are more familiar with each other, so we dare to express our ideas truthfully. (IVCA-0614-2341)

Celine believed that she was a teacher who "pursues to be the best," whether in her own work or in collaboration with other teachers, which explained why she strove for Lily's success in the competition. As she said, "I think I'm a little different from my colleagues. Sometimes they think it's OK to merely finish the task, but I don't think so. I always want to try more and make a little progress." The pursuit of her professional development made her perceive an insufficiently supportive and inadequate environment for collaboration, which she wanted to change: "I believe that collaboration will be beneficial to my development, but it is not enough at present. […] I hope to make our future collaborative more effective, and I hope it can help our whole team to improve collectively, not just my personal growth"

(IVCA-0614-3130).

Yingzi's Narrative Account

Yingzi was the head of the Chemistry Subject Group, but according to her own account, she was "assigned to this position." If the other teachers had not told me, it would be hard for me to see that this easygoing and low-key teacher had a leadership role in the office. In the stories Yingzi told, it was also true that she enjoyed playing a supportive role among the group of teachers, both at work and in life.

Yingzi's experience of being a county teacher

Yingzi was born in a village in Sanjiang County. She lived in a multi-child family with four sisters and a younger brother. When she was about to decide on her job, she found it challenging to learn about diverse career options from her rural living environment, and she could only get references from her family members and peers.

> To be honest, I didn't have many ideas about my career before I entered college. I didn't know what jobs were available… (Laughs) I just looked at what the people around me were doing. […] For those of us who grew up in rural areas, if we didn't have a job as a teacher or a doctor, we could only go back home and do farm work, so most of my family members were either doctors or teachers, and I chose one of the two. There were more doctors than teachers in my family, and I wanted to balance the number, then I chose chemical education as my major after the college entrance examination. (IVWA-0614-0134)

For Yingzi, the initial decision to become a teacher came after comparing the precariousness of farm work with the stability of a decent career, but that did not mean she had completely abandoned rural life. She still had her field in a small village of Sanjiang surrounded by mountains. She grew bamboo shoots, tea and other crops suitable for the local climate and sometimes brought some of the plants she grew to the office and shared them with other teachers. (FieldNotes-0610)

Similar to Celine, Yingzi also had been teaching in a village school and then entered

the S School through a job competition. Yingzi described what she felt was the difference between working in the countryside and teaching in the county:

> When I was in the village, I was less stressed about teaching but more tired about taking care of the children. […] there were many *left-behind* children in the countryside[1]. Rather than being a teacher, I was more like a half-mother to those children. […] If my students were sick, no one could send them to the hospital but we teachers. There were only elderly grandparents in their home, and their parents were not around, so only our class teacher (*banzhuren)* could take care of the children and report their health conditions to their parents. […] what parents cared more about was not their children's academic performance but their physical conditions. Some parents even thought that since the children were studying in school, teachers should be responsible for disciplining and caring for them. Fortunately, most parents could understand our job and pressure, and I […] was also willing to help them know more about their children's situations. [After I] came to Sanjiang County, I felt the increased pressure on teaching because this is the best secondary school in our county, and the [school] leaders have higher grade requirements. […] In the first year I came here, I taught Chemistry for three classes at the same time. My students were all third-year students and were stressed to take the graduation exam, so I felt that the pace of my work changed quickly and there was no adaptation stage. (IVWA-0614-0401)

Moving from the countryside to the county, Yingzi faced different external job requirements – from playing the role of a caregiver to promoting students' academic performance. However, she did not complain about the changed job requirements that made her stressed; instead, she quickly adapted to the county teaching environment and displayed her usual altruistic tendencies:

[1] *Left-behind* children (*留守儿童*): Due to the economic disparity between urban and rural areas in China, some rural residents go to the cities to seek jobs, but leave their children in rural areas for school education. These children are taken care by grandparents or other relatives, and are called *left-behind* children.

> My work philosophy is that *I will try my best to do whatever the school leaders arranged me to do.* Sometimes I tried my best and while did not have a particularly good result, but if I had taken my work seriously, I should be satisfied. […] for example, I am now spending a lot of time in the work of the class teacher (*banzhuren*). I think the work of a class teacher is much more stressful than teaching the subject of chemistry. Teaching chemistry only needs me to manage my class well, and my current knowledge level can support myself well and will not face any challenges on teaching, but the work of the class teacher is more than that. As a class teacher, I have to master the progress of different subjects and understand my students' general learning styles; more importantly, I should make it easier for teachers of other subjects who teach my class. (IVWA-0614-0641; emphasis added)

Yingzi rarely mentioned her classroom stories in interviews unless I brought up specific teaching-related questions. She explained that it was easier and more enjoyable to recall the details of her work outside the classroom and through her friendly relationships with other teachers. A story that Ms. Liang shared in a casual conversation confirmed this point. Liang, who loved Sanjiang's local food, was curious whether local wild bayberries would taste good if soaked in wine. After learning of Liang's idea, Yingzi spent a weekend with her husband picking a lot of the wild bayberries near their fields, a total of one kilogram, and gave them to Liang for her to drink. Liang did not expect Yingzi to pay so much attention to her whim, feeling impressed and moved by Yingzi's carefulness and enthusiasm (Fieldnotes-0701).

When I told the story of Liang to Yingzi, she was shy but did not think she had done something worth bragging about. "It was my usual way of getting along with my colleagues," she said. "It's rare for an urban teacher like Liang to teach in Sanjiang for so long, so I cherish the friendship with her. […] I think we are a team, and they (other Chemistry teachers) are willing to help me with any trouble I encounter, so I am also pleased to give them whatever I have. […] we are a group of people who care about each other" (IVWB-

0703-1335). Yingzi's kindness and the value she placed in her relationship with other teachers was also reflected in the following stories she shared about collaboration.

Perceptions of collaboration: "it narrowed the distance between us"

"I'm excited to work with them" (emphasis added). This was a sentence frequently mentioned by Yingzi in the interviews, the emotional support she received from her colleagues was also what Yingzi valued the most in collaboration. Next, Yingzi shared a story about her collaboration with other Chemistry teachers sorting out chemical laboratory equipment.

When Yingzi just came to Sanjiang, some education bureau leaders carried out an inspection of S school's resource allocation. The inspection of the Chemistry subject included confirming whether the equipment met the national standards or whether there was a gap between the resources of S school and other urban schools. The leaders of S school hoped that there would not be too many problems in the inspection, so the Chemistry teachers, including Yingzi, needed to sort out the chemical experimental equipment before the inspectors came.

> At that time, our school was short of teachers, and there was no laboratory technician in charge of the equipment, so our Chemistry teachers completed all the preparation of experimental chemical equipment. […] there were instrument loss and label damage […] For that inspection, two other Chemistry teachers and I had to sort out the instruments, label them, and document the types and quantities of the devices in the files. They were all trivial tasks, but I was particularly impressed because it was the first time we had worked together to get something done. […] it was a tough time. As soon as our classes were over, Lily and I, along with a retired teacher, went to the lab to label and document the names of instruments. We had to be very careful. The retired teacher's eyesight was not so good, so Lily and I volunteered to take on more work. We agreed on the division of labour; each person was responsible for half a part of the work, so we gradually finished sorting out the equipment. Other subject

> teachers were also bustling. Everyone seemed to be working hard to complete that important task, and I felt quite a sense of belonging. […] I spent so much time in the lab that the air outside smelled different when I walked out of the lab. (IVWB-0703-0717)

The story shared by Yingzi reflects that because of the scarcity of teachers, these administrative tasks brought extra workload to the front-line teachers in the county and took up a lot of teachers' rest time. However, Yingzi believed those inspections had created a chance for her to spend time with her colleagues and, in her view, a collaborative experience worth remembering.

> After completing that inspection, I felt I was more familiar with the experimental instruments […] and I had more confidence in instructing my students to do experiments. I also require my students to form the habit of sorting out equipment each time. […] I felt like my relationship with Lily, and other Chemistry teachers was also closer because we had spent much time doing the same thing. I learned that they were meticulous, so I began to dare to ask them for advice more frequently; unlike when I first came to this school, I was afraid of initiatively asking questions. […] The more patiently they replied, the more willing I was to communicate with them, which seemed to narrow the distance between us. (IVWB-0703-1201)

Although Yingzi described the work of sorting out equipment as hard and "trivial," she was satisfied with the time she had spent with other teachers. The friendly relationship between her and her colleagues, the time they spent together and the shared experience were what Yingzi saw as the value of collaboration.

The metaphor of the "Base Camp": strong sense of belonging

As reflected in the above story, Yingzi could benefit from her close ties to other teachers even in a task with strong administrative attributes. Moreover, in the following narrative, she mentioned a "Base Camp" metaphor that vividly outlined her sense of group belonging with other Chemistry teachers:

> When we [Chemistry teachers] need to gather together to arrange some daily work or discuss the division of labour on research topics, we may go to two places, the meeting room in the administration building and the office where we are now. […] We call this office our 'Base Camp'. [For example,] if we decide to have a brief meeting, we will send a notice in the WeChat group saying: 'Come to the base camp for a meeting!' Then everyone will soon come to this office. […] Going to the meeting room does not have such a friendly feeling. We have to apply to the school for approval and go through an appointment process to use the meeting room, which is too formal and a little troublesome, so we will go to the meeting room only if we want to take photographs of our activities and archive our meeting documents. There is a large LED screen in the meeting room, and we usually project the formal theme of our discussion on the screen. In comparison, discussing issues at our base camp is more casual, and anyone who isn't available does not have to formally submit a request for leave. (IVWB-0703-2133)

The metaphor shared by Yingzi supports Celine's distinction between formal and informal collaboration – in formal collaboration, teachers paid more attention to the *process* of collaboration; in informal collaboration, teachers conversed in a daily and casual manner, and the exchange of opinions was the main focus. More specifically, Yingzi described that in pre-planned discussions, the differences between the "Base Camp" and the "meeting room" brought about not only different atmospheres of collaboration but also different *boundaries* between the people involved in the discussion.

> If we are going to the meeting room, it's decided and clear who should be involved in that meeting, and I feel like sometimes it's a rejection for teachers who aren't in the meeting group. While at the base camp, we sometimes discussed topics related to our research project, and other teachers in the office – even if they were not a member of the project – were willing to share their opinions, say, Liang usually gave some useful suggestions, she was more familiar with research projects than us (local teachers).

> […] that leads us to prefer to discuss in the base camp most of the time, because there are more people and everyone is comfortable to be involved, and what comes out is more helpful to the project. (IVWB-0703-2448)

The name "Base Camp" shows chemistry teachers' tacit understanding and sense of identity with this group. Compared with the administrative space that required appointments and complicated procedures, the teachers of the Chemistry Group created a new concept of "Base Camp" based on the office so as to make this space exclusive to them. That was also what Yingzi treasured:

> They chose me to be the head of the Chemistry Group; [but] in fact, I rarely assign tasks to anyone. I don't think it (being the group head) means I have any leadership status; I just do some supportive work. Most importantly, this is a base camp where *everyone can say something,* whether you are part of a project or not. I don't think it is necessary to have that distinction. […] We stick together and share what we know, and that relationship allows us to progress together. (IVWB-0703-2804; emphasis added)

Yingzi did not care about her administrative role in the subject group, nor did she think too much about how it differed from the roles of other teachers in the group. Therefore, Yingzi did not, and did not intend to, take on a leadership role either in her daily work or in the collaboration. She valued teachers' friendship and equal relationships within the group. In her opinion, such mutual dependence and equality among teachers promoted the mutual development of the Chemistry teachers. In the teachers' research project shown in Chapter 5, we will see that Yingzi played a similar 'passive' role in the project – Yingzi's participation was more influenced by other teachers (especially Lily) than by her own inner drive. I will demonstrate more reasons for her to play that role.

Lily's Narrative Accounts

Besides Ms. Liang, Lily was a female teacher with the longest teaching years among Sanjiang local teachers in my study. She had worked as a teacher in schools, education

bureaus and other educational organizations for 24 years since she graduated from college in 1998. Compared with other Chemistry teachers, Lily had richer and more diverse experiences in administrative work, but she finally returned to the current Chemistry office. The reasons for her choice will be revealed in her narratives.

Becoming a teacher in Sanjiang

"I became a teacher passively, but I think the job is pretty good now." By "passively", Lily meant that she did not firmly choose to become a teacher, but was assigned the education major by her college. Like the other students who grew up in rural areas, Lily's choice of college major was closely related to her career aspirations when she graduated high school. In order to gain a greater chance of being admitted, she chose to be "obedient to the adjustment" – an option for Chinese students after the college entrance examination indicating that the application could be assigned to other majors if the first major that she wanted to pursue was too demanding.

Though Lily put the job of teacher at the bottom of her consideration, the college that she applied to adjust her to the major of Chemical Education. However, Lily did not complain about the adjustment. She said, *"既来之，则安之 (take things as they come).* At least I can return to my town to be a teacher."

The first school Lily worked in after graduation was located at the junction of Guyi Town and Sanjiang County. Since that school had more limited space and teachers than S school, Lily regarded it as a typical rural school and felt the gap between the working environments of the two schools after she moved to Sanjiang. In Guyi Town, teachers were not highly motivated to work, and there was no sense of competition among teacher colleagues. However, as S school was one of the better schools in Sanjiang County, teachers of S school tended to occupy students' self-study time as much as possible, and sometimes teachers competed for self-study classes because of the time conflicts. Lily found this was rare in town schools, and she attributed the competition for time among teachers in S school to the fact that they had higher demands on students' academic performance and perceived

more work pressure.

When asked whether she was involved in the competition for students' self-study classes, Lily said that she was very "*佛系* (*Buddhist-like*, referring to the mentality of not fighting and having no desire)" and she believed that the teachers of the three main subjects (Chinese, Math and English) needed the time for self-study classes more than she did. Lily thought that the three main subjects had brought much academic pressure on students, and she hoped that Chemistry would not add more burden to them. Therefore, she sometimes played videos for students in her chemistry classes as a reward for students' good performance.

"I prefer the purity of teaching." By *purity,* Lily emphasized a simple interpersonal relationship and that her teaching work was less affected by administrative arrangements. Lily had worked in some administrative departments, such as the Office of Teaching Research and the County Education Bureau, but in her opinion, these jobs were different from the teaching work of teachers.

> In 2013, I worked in the Office of Teaching Research for one year. I didn't fit in there very well because that job often required me to travel to the city or the countryside at least three times a month. Another content of the job was called 'sending teachers to the countryside' (*送教下乡*), namely, we organized urban teachers who were more experienced than rural teachers to prepare an open class and to display it in rural schools. It was a big part of our work. […] I don't think it's interesting because it felt like I was planned by someone else every day. [During that time] I didn't know where I was going and whom I would deal with every day when I woke up in the morning. I didn't like those feelings. (IVHA-0616-1403)

After finishing the administrative work that Lily did not enjoy much, she did not pursue a promotion in that position but returned to S School to continue teaching Chemistry.

> The teacher's job is less likely to involve intrigue than other professions. The first reason is that I can stay with my students. All my students are simple country

children, their world is not complicated, and I enjoy communicating with them. Also, I think my colleagues in my office are kind, and we have a harmonious relationship. I like to work in such a friendly atmosphere. […] and as I said, when I teach, I write my own lesson plan and arrange the teaching schedules by myself. I know exactly how the next class will be taught and how the next day's work will be arranged instead of waiting for someone's command in a daze. […] so I like my current working condition. Every day is regular and enjoyable. (IVHA-0616-1235)

After feeling the differences between teacher's work and administrative work, Lily realized that what she valued was the harmonious and friendly atmosphere among teachers. Moreover, she believed that teaching meant more discretionary power than administrative work, so she invested her commitment to being a subject teacher and staying with her students.

Lily's story of collaboration: "We are a united team"

The collaboration story shared by Lily was also the story of her participation in the video-recording competition with the help of Celine and Yingzi. Celine and Yingzi not only shared important information with Lily about the time and deadline of the competition, but also spent a lot of time helping Lily record her videos and giving constructive suggestions on how to improve Lily's teaching in the videos. In her story, she described how she felt about the support she perceived from her colleagues.

At first, I didn't know about that [competition], but Celine found the related information and reminded me to submit a video if I wanted to participate, so I thought I could give it a try. It took us two weeks to prepare [for the competition]. Yingzi and Celine were with me all the time and gave me a bunch of advice even though it was my competition. […] there were mistakes in the first video recording, but they were not afraid of wasting time; they stayed with me all day and re-recorded over and over again. When [the video recording] was done, we brought it back to our office, and Keke added subtitles for my important experimental part […] they was willing to take

the time to help me, for which I was grateful. Finally, the video was submitted in time and won a prize for me. (IVHA-0616-2332)

Lily's accounts portrayed her memories of how each teacher supported her in completing her class recording. She also admitted that the collaboration confirmed her willingness to help her colleagues.

> I think the most important part [of the collaboration] is our awareness of the collective. We are a united team; they (the other teachers) would not refuse to help me just because it (the recorded class) had nothing to do with them. I am also willing to support other teachers in whatever way possible. (IVHA-0616-2640)

The impact of collaboration on Lily was not limited to her relationship with other teachers but also her teaching beliefs. Lily added, "the class on improving a textbook experiment made me think I can encourage my students to do the same. I don't want my students to feel that what is presented in the textbook is the only option, and they should dare to think about an alternative way [of the experiment]. This competition is also an opportunity for our teachers to criticize the textbook. Sometimes the experimental equipment selected in the textbook was not the most practical, and only those who have practiced the experiment know that some drugs are unstable and do not easily show the chemistry effect. […] perhaps the textbook editors will revise the experiments after we propose an improved plan in the [recorded class] competition." (IVHA-0616-2503)

Textbooks used by primary and secondary schools in China are edited and published by a limited range of official publishers. It is common for compulsory schools in a city or a province to use the same version of the textbook, so the local education bureau will hold some activities or competitions directly related to the content of the books, just like the one that Lily had participated in. To explain the nature of some chemical elements, textbook editors introduce some chemistry experiments, such as that carbon dioxide produced in the laboratory can make a burning wood go out. These experiments require all the chemistry teachers to memorize the content and demonstrate to students in the laboratory so as to

promote students' understanding of chemical knowledge. In this competition, Lily had an opportunity to look critically at the textbooks. When she was encouraged to think about whether there were any deficiencies in the selection of equipment or chemical drugs in these experiments, she also realized the possibility of transferring this thinking to her students, thus impacting her teaching beliefs.

Lily's reflections: "Beneficial Collaboration Should Rely on Subtle Daily Efforts"

"The really beneficial collaboration should rely on subtle daily efforts." As a front-line teacher with rich administrative experience, Lily recalled the activities of "sending teachers to the countryside" and the collaboration between her and fellow teachers in her office, frankly expressing her doubts about some highly organized activities and her affirmation of the value of daily discussion.

> I feel that although the intention of 'sending teachers to the countryside is worthy of recognition, it is too unusual and unreal. [To organize such activities,] we usually invite an urban teacher to prepare a demonstration lesson, asking a class of students to attend the class, then rural teachers will come to observe the urban teacher's teaching strategies. If you think about it, this class is called 'demonstration class,' it will not be what we normally do in our classrooms, right? The students' performance will not be the real state; they will answer correctly in the same voice in those classes as if everything is understood well, but how is that possible? […] when the urban teachers leave, our rural teachers still have to deal with students with poor learning foundations, and the teaching methods shown in those demonstration classes are ineffective in our classrooms. […] for such a demonstration class, we spent a lot of time and effort but did not really help the rural teachers. I think it is futile. (IVHA-0616-3502)

Holding the beliefs that effective collaboration should reflect authentic teaching problems, Lily described the collaboration that "relies on subtle efforts" that she perceived in her office.

> Teachers of our Chemistry Subject Group have a habit of observing each other's classes. It is not arranged by someone but our initiative action, say, a certain teacher in the office said that 'today you can come to listen to my class', then the other teachers would come. If, after listening to my class, a teacher finds a flaw in my teaching strategy, she will tell me after class so that I can pay attention to it immediately in my next classes […] then I will get direct improvement quickly. Or even if they don't attend my lectures, there was a time when I go back to the office after a class and complained 'my students are not familiar with some basic chemical equations,' then several other teachers replied 'maybe you can try doing random quizzes during students' self-study classes and ask them to recite down chemical formulas.' I realized I hadn't used it [the method] before and it might work, so I practiced it in my class. It turned out to improve my students' knowledge foundation, and I made it part of my regular teaching methods. (IVHA-0616-3701)

The Chemistry teachers' office provided a safe space for discussion on the basis of the subject teaching, enabling Lily to bring her daily teaching segments back to the space in the form of short stories and receive others' responses. Due to the veracity of these stories and the immediacy of the reactions, Lily believed that it was the daily collaboration that has benefited her the most.

Chapter Summary

In this chapter, I presented narrative accounts of five Chemistry teachers: Liang, Keke, Celine, Yingzi and Lily. Each teacher's narrative accounts included the past experience they had when they walked into S school and became a member of the Chemistry Subject group, as well as their feelings and perceptions of their ongoing school life. The stories of the five teachers often echoed each other, mutually presenting the details of the group of teachers with deep friendship. Their stories on daily collaboration also explained how their teaching beliefs and knowledge may intertwine and influence each other. Even if five teachers' understandings of collaboration varied, their stories reflected the meaning they

ascribed to collaboration and provided an implicit basis for the roles teachers might play in the research project I will describe next.

Chapter 5 – The Case: Chemistry Teachers' Research-Based Collaboration

Introduction

When I started my research, the Chemistry teachers were in the middle stage of their research project, in which each member of the group used mind maps to teach and videotape a review lesson. They called them "case lessons" for their project. While each teacher was teaching her lesson, other teachers would sit in the back of the classroom, observe and take notes. Organized by Lily, the project members held four meetings during the semester to divide the content of Chemistry teaching units and summarize the main tasks of each stage. During my stay in S school, I was able to sit in on Celine's and Yingzi's case lessons and attend the last regular meeting of the semester organized by Lily. After these observations, in the second interview with each teacher, I invited them to share the stories and feelings that impressed them deeply in participating in this collaborative project.

In this chapter, I organize and analyze the stories told by the Chemistry teachers, using the method of coding analysis while retaining the boundaries of the story as I mentioned in the methodology chapter. I present the stories of the teachers based on the content and structure of the collaboration case, including the motivations of the teachers to participate in the research project, teachers' perceptions about the project, the obstacles they encountered in the research, and their expectations for project improvement or future collaboration.

The motivations for the collaboration

Common Problems in Teaching Practice

From the interviews, I noticed that almost every teacher took the daily routine of bringing the confusion they encountered in their teaching back to the office to find resonance or support from other teachers. The initial inspiration for the collaborative project of Chemistry teachers was a common problem they found in their subject teaching: how to teach Chemistry review sessions better?

As the initiator of the research project, Lily realized she did not feel up to leading her

students to review for exams. She used a metaphor of *"炒旧菜" ("Cooking Left-overs"* – putting already prepared dishes back into the pot and cooking them again) to describe the state of her students in her review sessions:

> Students felt that they had mastered the knowledge and that our teachers were just cooking old dishes over and over again, so they were not motivated to learn in review sessions. Those [students] who were self-conscious would take notes, while those who didn't pay attention to review sessions would not. (IVHB-0720-0015)

The students' learning status prompted Lily to reflect on her teaching methods. Lily found that in her review sessions, she merely reproduced what she had taught before on the blackboard and orally repeated it, and that she lacked some effective ways to know her students' degree of mastery of the knowledge.

Lily brought that confusion back to the office, and it resonated with other Chemistry teachers. Celine, for example, also found herself struggling in her review sessions. She compared the difference between teaching a new class and a review session: "I think I am good at teaching a new class. I know how to get my students interested in new knowledge. However, when I teach a review session, it seems that I had not mastered a systematic approach to cover the knowledge I had already taught. I only used some traditional methods, such as asking my students to do Chemistry exercises, then I corrected and explained in class. It doesn't seem efficient to me."

As Celine mentioned, she rated the "exercise-comment" model in review sessions as "traditional," so she was looking for a new teaching approach. Similar hopes for a new method were also expressed by Keke and Yingzi. When Keke learned about Lily and other teachers' ideas of improving the review sessions, she also looked forward to a new teaching method. She said: "We (Chemistry teachers) seemed to have never tried to use a research project to improve teaching, nor have we tried to combine mind maps with teaching. When other teachers came up with it, I believed that it would be more interesting [than our common teaching methods], and my students might be interested. I wanted to make an attempt that is

different from usual." In Keke's words, she maintained her consistent concerns for her students. Considering the research project from the standpoint of students was her initial starting point for entering the collaboration. She said, "I think if I were a student, I would be interested in a different teaching method." This concern for her students' perspectives ran through her involvement in the project.

Yingzi's initial feelings when she joined the project slightly differed from Lily's, Celine's and Keke's. She seemed more influenced by other teachers: "I became a member of the research group under the leadership of Lily." However, Yingzi still felt and trusted the relevance of the research project to her daily teaching. She said: "I have minimal experience in any kind of research, but the topic of this research project comes from our review sessions and is closely related to our daily teaching, so I was looking forward to it at the beginning." In her daily work, Yingzi self-described herself as more low-key and less likely to initiate topics or proposals in the office than her colleagues. However, she sincerely expressed her respect for the project and her trust in Lily, who initiated it. Yingzi's trust stemmed from the original goal of the project, which was to improve their common teaching strategies in review sessions. With this common goal in mind, how did teachers turn their attention to the choice of mind maps? I will explore further in the next section.

The Choice of Mind Maps: Teachers' Previous Experience

Coincidentally, when teachers talked about how they incorporated mind mapping into the collaborative project, they all looked back on their own educational experience – as a student or as a teacher. Since Lily was the one who made the decision of mind mapping, I will start with her narratives first.

Although Lily was the project initiator who found the teaching problem and proposed the research project, at first, she did not know how to find a new teaching method as a substitute for the "traditional" review strategies. Lily contacted a friend who was a secondary school Chemistry teacher in the city (Liuzhou) and asked for his advice. The teacher said that he recently tried to guide his students to draw mind maps during their review sessions, so he

encouraged Lily to give them a try. Lily was initially hesitant, but when she reviewed her own teaching, she realized that she had used similar teaching methods in her classes. She said:

> I remembered that I used to present Chemistry knowledge as a mind map in my class […] I showed a big concept and then some sub-concepts; I think it was a mind map. […] then I thought, well, I am not totally unfamiliar with mind mapping, so I will try it out and play a guiding role [in students' mind mapping]. (IVHB-0720-1504)

Similarly, Yingzi also recalled how her students practiced mind mapping in their Geography class: "Lily suggested using mind maps to review. I didn't realize what it was at first, but then I remembered that my students seemed to have used mind maps in their Geography class. The Geography teacher asked them to draw some graphics in order to memorize some geographical locations and make generations. I found that my students were interested in drawing those pictures, so I think it would be nice if our Chemistry class could be as interesting and could help our students think more clearly."

Although Celine had no experience related to mind maps from her past teaching, she knew that some of her colleagues in other subjects had also used mind mapping, and she felt confident that she would gain relevant strategies from attending a research project: "I knew there were other teachers who used mind mapping. It was not popularized at S school, but I thought doing some research on this gap might lead to a better way than our traditional review methods."

Keke's story is typical in that she was the only teacher who remembered her own mind-mapping story from her school days. Keke found that she was no stranger to mind mapping. "I remember when I was in secondary school, a teacher taught us to draw a fishbone diagram," said Keke. "It was a really interesting process. I drew a long line and then lined up the information I was learning, and finally added the fish head and tail. I think it is creative and memorable. Since I enjoyed the process of mind mapping, my students might enjoy it as well."

When Lily proposed mind maps, the four teachers, including Lily herself, obtained their opinions of what mind maps are and their possible role based on their past relevant teaching experience. In tracing their past memories, teachers were looking for evidence to justify how "mind maps may work" and where the evidence was not from theories they had learned but rather from their own or others' past teaching practices.

A Necessary Path for Teachers' Career Advancement

The association between participating in a research-based educational project and career advancement was a motivation for almost all teachers involved in the collaboration. Lily was the fastest to connect a teaching problem to be solved (improving Chemistry review sessions) with the promotion of a professional title through a research project. She said:

> When we were chatting (in the office), we found that everyone was unsatisfied with our review sessions. Then I thought, since we all need to get a higher professional title through some activities, we should try to do a research project on this problem, which may be helpful for both our promotion and our teaching. (IVHB-0720-0837)

In the office, Lily was always active in communicating and exchanging ideas with other teachers, and as mentioned in Lily's narrative account, she actively participated in various teaching competitions to accumulate the resume needed to promote her professional title. Therefore, in this case, she saw the potential to turn a teaching problem into a research project and improve other teachers' titles.

According to the official documents of the Liuzhou Education Bureau (2022), the current teachers' professional titles are divided into five categories (increasing in degree): Third-level Teacher, Second-level Teacher, First-level Teacher, Vice Senior Teacher and Senior Teacher. Among them, the title of Senior Teacher in Chinese compulsory education is equivalent to that of Professor in universities. In terms of the application materials, teachers who intend to apply for the Senior Teacher title must have experience of participating in provincial-level educational research projects or initiating municipal-level projects. Although for other levels of teachers' professional titles, experience related to research projects is not

mandatory in the official application requirements, teachers can still see the value and necessity of research projects in their job promotion. As Celine said bluntly, “I can’t get a [higher] title without participating in a research project” (IVXB-0726-0001). Celine had been preparing her application for professional title promotion since 2021. After reading the official documents, she realized the importance of research projects and teaching competitions.

Keke also connected her engagement in the research project with her professional promotion and development:

> I decided to join the research group. […] One reason was that we needed to chase higher professional titles, and the other reason was that I wanted to take this opportunity to learn from other teachers in the group and improve my ability in teaching Chemistry class. (IVKB-0721-0001)

As the youngest teacher in the Chemistry office, Keke had always been humble enough to seek advice from other teachers, and she was also assertive about her teaching and career development. In her narratives, the reasons that prompted her to be a member of this research group included the need for her career advancement and her need for self-growth, both of which were indispensable. In subsequent stories, she revealed more self-reflections about how she had grown in collaboration and her thoughts on how her students could benefit from the project.

Compared to other teachers who clearly grasped the connections between research projects and career advancement, Yingzi was less focused and motivated about improving her professional title. She said: “I don’t realize how important the project is if people [other Chemistry teachers] don’t tell me” (IVWB-0703-1800). The online bulletin board inside S school often published research projects initiated by the local education bureau’s teaching and research staff and the opportunities offered by the education bureau for teachers to start their own projects. Yingzi’s attitude towards the information had always been that she knew of the existence of those research projects but did not feel their relevance to her. It was not until Lily

proposed the idea that she found herself needing to approach the project:

> When a leader like Lily said to do a project together, I got a kind of reminder that the project was necessary and required. […] At first, I figured doing research was hard, and not doing it didn't seem to matter to me. […] but now I have started to pay more attention to it and found that the research project is important for my job title application. (IVWB-0703-1828)

Yingzi referred to Lily as the "leader," and this name here is not an administrative identity; in Yingzi's context, she believed that Lily was the person who led her forward, so she recognized Lily's leadership significance in the research project. Yingzi also learned from her trusted colleagues about the connections between research projects and career development, and this new understanding, which she had internalized as her own belief, became the motivation for her to participate in the project.

Wang and Chen (2020) once expressed concerns about the "Hollowing" phenomenon (p. 43) associated with Chinese teachers' research projects due to excessive utilitarianism (participating in collective research for promotion and professional title); namely, teachers just work together for advancement without reconstructing experience and knowledge. The promotion of professional titles is still a vital driving motivation for county teachers to carry out their research projects. However, it can be seen from the stories of the teachers actively devoting themselves to various collective activities conducive to the promotion of professional titles, that they still have the possibility of generating new experiences and new teaching methods. In the stories of chemistry teachers, the research project provided them with the opportunity to communicate with urban teachers and familiarized them with the mind-maps teaching method. For county teachers, limited resources also included limited information. Yingzi's answer to the question "how do a teacher get promoted?" was vague, while the research project provided her with new ways to obtain information and gave teachers like Celine access to urban teaching experience. Therefore, the teacher research projects of rural and county teachers may be in a different context from those of urban

teachers, and the changes these projects bring to teachers can not be generalized only from urban school teachers' experiences.

Teachers' Perceptions of the Collaboration

Friendship as the Foundation of Collaboration

When it came to how they felt about the process of collaboration, supports from peers and friendship with other Chemistry teachers were the recurring themes that each teacher talked about repeatedly. The role of friendship-based support was mainly reflected through, firstly, the exchange of knowledge and experience among teachers, and secondly, back to the metaphor of the "Base Camp" mentioned by Yingzi: the foundation of effective collaboration being the sense of belonging to the group.

For example, Keke believed that her case lesson could be completed with the advice of other Chemistry teachers, so she attributed her lesson to "the result of team honing." She saw the project as an opportunity to learn about the teaching wisdom of other teachers; she mentioned that she was amazed by a male teacher's strategy of using mind maps:

> The teacher came to the class with a very large digital mind map that covered an entire Chemistry unit, and each point was related to the other. He explained his mind map in the course of his lesson. My feeling after that lesson was that Chemistry could still be taught like this. (IVKB-0721-1106)

Keke did not have much experience with using mind maps in class, but after she saw positive examples from other teachers, she felt she could do the same, so she became more confident in preparing her case lesson.

Celine used the term "collaborative spirit" to describe the atmosphere of teachers' mutual help that she perceived in the project. She talked about the competition related to homework design. Once, after class, Celine and other teachers were taking a break in their office. Celine did not intentionally initiate a conversation for the competition, but casually mentioned that she did not think their assignment design made sense at the moment. Soon, the other teachers present offered their opinions, and in the course of their discussion, they

not only made suggestions, but also directly improved the design of their mind mapping lessons. Celine said:

> After I saw other teachers' case lessons, I felt like the homework was all about the after-school work, and there was no pre-class work for students to review their textbooks and knowledge about drawing mind maps. Yingzi immediately added her suggestions, saying that she felt the unreasonable part of the homework design was that it ignored students' previous knowledge foundation. [...] we teachers present talked freely, one by one. Finally, we added an after-class Chemistry experiment, and let the students do a chemistry experiment to consolidate the effect of review sessions. [In this way,] all the homework before and after class of the review class was designed well. I think we have collaborative spirit. (IVXB-0726-0755)

I was also sitting in the Chemistry teachers' office writing my fieldnotes when Celine initiated that conversation. The topic started by Celine was unexpected, but it quickly inspired all the teachers around to get involved, which Celine saw as proof that every teacher was willing to share their wisdom. When the conversation was over, Celine was excited. She knew that my thesis topic was related to collaboration, so she specifically called my name and reminded me: "Have you seen it? Our collaboration is just like this, very quick and effective. Everyone said a word, then we can finish a homework design." I was impressed by Celine's sense of accomplishment, and I realized that it was what she valued: working together to accomplish something.

Yingzi also used the term "collaborative spirit," but she placed more emphasis on the relationship between teachers. She attributed the supports she received from other teachers to the "kindness" of other teachers. When preparing her case lesson, she wanted to draw a mind map on her computer, and then copy the courseware to the classroom computer with a USB flash drive. However, she was not good at the technology and did not know how to use the functions of mind mapping software, so she turned to some younger teachers for help. As said by Yingzi:

> Those teachers were happy to tell me how to do it, and I finished my courseware with their help. I think I learned more than the technology. I began to think, is there anything I can help other teachers? I feel the collaborative spirit of the project group, which is a kind of kindness to help others and answer their questions. (IVWB-0703-1615)

As Yingzi was concerned about teachers' interpersonal relationship, she shared the metaphor of the "Base Camp" (see Yingzi's Narrative Accounts in Chapter 4, pp. 87-88). The "Base Camp" referred to the office shared by eight Chemistry teachers. In this metaphor, the office was not only a workplace for teachers, but also a place of teachers' interactions with emotional connections. Lily once said that some of the young teachers in the research group were not in the office, but often came to the office to "visit" the old teachers like Lily, Yingzi and Celine, because the older teachers played the role of "backbone", making important decisions on teaching and sometimes organizing entertainment activities among the Chemistry subject group. Extending from this metaphor, it invested teachers' informal relationships with life-like interaction. This kind of "informal" relationship allowed teachers to share their teaching problems in the office safely, just like the time when Lily proposed the research project in the office, and also like the story about designing students' homework shared by Celine above.

Lily also clearly pointed out that the friendship among Chemistry teachers built around the "Base Camp" made their communication on the project more effective. Lily said:

> We were supposed to comment on each other after the case lessons, but we did not hold a special meeting to discuss it. […] if I want to give some special feedback, I will not think of what to say at once. [However,] in the base camp, we used small-talk to discuss the problems we find in case lessons. […for example,] I might casually say to a teacher who has just taken a class, 'It looks like you should change the way you ask questions.' […] Anyway, the advice that came out of this small talk, or pointing out the shortcomings of another teacher, would not be taken too seriously and not

affect our relationship. (IVHB-0720-2640)

It can be said that the emotional connection and friendship established by teachers in the base camp became the foundation for their frank communication, and that informal space also made the discussion of teaching problems more efficient. However, might the emphasis placed on teachers' friendship hinder the possibility of deeper communication? In the forthcoming section *Obstacles of Better Collaboration*, teachers' stories will offer a response to this critical question in the teacher collaboration literature.

The Focus on Students in the Project

Students' lack of enthusiasm in Chemistry review sessions was the initial teaching problem that led to the establishment and implementation of the Chemistry teachers' research project. How did teachers perceive changes in students over the course of the project? How did they pay attention to their students? Stories shared in this section will answer these questions.

I start with Keke's stories because she maintained a strong motivation of focusing on her students. In her case lesson, she used mind maps to teach a Chemistry review lesson related to combustibles, and in the last 10 minutes of the lesson, she asked students to use mind mapping to draw out what they had reviewed in the class. She found that even though the knowledge contents of the lesson were the same, students were innovative in the process of painting. "I was pleasantly surprised to see some of my students get creative with mind maps," she said. "Several girls designed tree-shaped patterns to allow knowledge to flow out along the tree trunk, which I had never taught before. Another student drew a fire extinguisher in the part of fire prevention knowledge. ... I found that students were willing to draw maps, because they were mentally active. That made me happy" (IVKB-0721-0437). Keke was delighted to realize that the mind-mapping teaching method evoked the students' need to express themselves, so felt gratified by the high level of student participation. At the same time, she lacked guidance in the process of drawing mind maps, which she realized only after being reminded by other teachers. She said:

> Although students were willing to draw, not all students knew how to draw a good mind map. Some students did not integrate their own ideas into their maps, their works were conventional, and they just redrew the mind map I had drawn on class [...] that was what other teachers noticed when they were observing my lesson, and they reminded me not to just look at good students' outcomes, but also the students who did not really know what a mind map was. I could not have realized that without other teachers' observations. (IVKB-0721-0927)

Other teachers played the role of observers, supporting Keke to find a direction so as to make progress, namely, to provide more guidance and ensure different students' participation in the class.

Lily also found that mind mapping stopped her students from being "numb" during revision sessions: "Mind mapping gave them something to do instead of merely sitting there and listening to teachers" (IVHB-0720-2330). Lily said that she paid the most attention to whether students' state in class changed or not. She found that students were no longer in a daze or easily distracted.

After observing Celine's case lesson, I found that Celine was a teacher who attached great importance to interactions with her students. In the introductory part of her lesson, she answered students' doubts quickly, even if she heard a whisper. Her use of electronic mind maps in class was interactive. She temporarily hid the sub-items of each knowledge point on the digital blackboard, and then randomly asked students to review the relevant knowledge points they had learned, such as chemical equations. After the students had answered the questions, she expanded on the sub-items to strengthen their memory. She reflected: "mind maps provided clear review clues for my students" (IVXB-0726-1238). Similar to Lily, Celine believed that the way to test the effectiveness of mind maps was through students' performance in exams:

> I deliberately chose the most difficult unit (*Acid, Alkali and Salt*) as my case lesson, because my previous students did not do well in this part of the review. This time, I

> asked my students to draw their mind maps after class. By doing it themselves, they may know more about what they had not grasped well. […] if this method was effective, I hoped to adopt this mind mapping teaching in future high school entrance exam review sessions. (IVXB-0726-2744)

Slightly different from other teachers, Yingzi provided less guidance to her students. She still routinely reviewed the chemistry knowledge of a unit by asking some questions for students to answer. The only part of her lesson related to mind maps was before the end of class, when she asked students to draw a mind map of that day's review content as their homework. Instead of integrating mind mapping into her Chemistry class, she relied more on the mind mapping foundations that her students had previously mastered in their Geography lessons.

Yingzi's explanation for this was that she believed that the logic of the mind map was a hierarchical structure of knowledge points. She only needed to guide her students to recall the derivative knowledge of each chemical concept in class, and students would be able to memorize and present the knowledge after class in forms of mind maps. However, she also found some problems with the students' mind maps:

> [Some students] were perfunctory – they drew the maps merely to complete the task […] the works submitted by students were very similar. I did not find any innovative points from their maps. (IVWB-0703-1558)

In Yingzi's case lesson, she did not make a fundamental change in her teaching method. Mind mapping failed to be integrated organically.

Outcomes and Impacts of the Project

In this part, I will discuss how participating in a collaborative research project affected the teachers and how the teachers viewed mind mapping as a new Chemistry review strategy.

Lily first talked about the change in her teaching beliefs. She felt the necessity of "making students more active" based on her noticing that students became more focused

when drawing mind maps:

> I am not a very expressive person, and I guess there are some students like me who do not know how to use language logic to review Chemistry knowledge […] Mind maps can help students make summaries in the form of some images and pictures, and students can clearly tell what knowledge they have memorized after review sessions. [...] I feel like in my future teaching, I need to ensure similar kinds of student engagement. (IVHB-0720-1342)

Lily's story remained consistent with her motivation: to enhance student agency. Lily also found herself becoming more familiar with the role of collaboration in educational research. Although Lily was the organizer of this project, it was her first time doing research, and she was not familiar with the process of completing a project. However, Lily said that she was "fortunate" to get help from her teacher friend from Liuzhou, an urban teacher with rich research experience. The urban teacher provided a great deal of support and encouragement. In addition to teaching Lily the basic process of the project, the urban teacher gave her emotional support, encouraging her to communicate no matter what problems she encountered. When the urban teacher came to S school to attend some regular meetings, other county teachers treasured the opportunity to communicate with him, asking teaching questions unrelated to the subject. With the support of her peers and colleagues, Lily gained confidence in completing the project, which made her expect to participate in other such projects in the future.

Keke acknowledged that the research project provided her with an opportunity to interact with and learn from other teachers. Since the S school did not normally encourage teachers to observe one other's classes, Keke said the project gave her a chance to hear different teachers' opinions and learn from other teachers' teaching experiences. "I probably would not be able to use mind mapping well on my own," Keke said. "Before taking my own case lesson, I observed two case lessons of more experienced teachers. They made me realize that mind mapping was about clearly presenting the review context and integrate the

Chemistry knowledge of a unit, then I gradually knew how to teach my own class." (IVKB-0721-1033).

Keke also classified the types of classes mind mapping could be applied to. She thought that classes which require in-depth explanation of one knowledge point with many examples would not match mind mapping, while classes that covered dispersed knowledge points would be more suitable. Keke also mentioned that while at the beginning, she was unfamiliar with doing research projects, the existence of a teacher group supported her in overcoming difficulties. As Keke said: "This was my first time to participate in a research project, so I came to this project with a learning mindset from the beginning. Other teachers shared their experiences with me, and it became a process of gradual improvement for me" (IVKB-0721-1749). Keke positioned herself as a learner in the collaboration, and the experience of other teachers served as a reference point for her to improve her teaching. She valued the opportunity to *see* other teachers; at the same time, she also put her teaching in a position of being observed and evaluated during collaboration. In her opinion, other teachers could identify her shortcomings more clearly than herself, which was valuable information to carry back into the classroom.

Obstacles Facing Improved Collaboration

Superficial Collaboration

In reviewing and analyzing teachers' stories, I found that teachers used the phrase "our collaboration was not deep enough" many times to express their regrets about their project, so I use the word *superficial* to depict their teacher collaboration. Superficiality was reflected in two aspects: on the level of teacher reflection; and in the formal nature of the project.

Celine was among the first to note that the teacher collaboration felt a bit rigid. At the beginning of the semester, Lily had organized a formal meeting, at which the form of 'research through case lesson' was decided upon. In Celine's view, the adopted format was relatively simple:

> Each of us had been assigned a unit to review and then we came back to our office to prepare our own case lesson […] It was like, a teacher prepared a case lesson (by herself), and then she taught the lesson, we went to listen to it and simply commented on it after observation, which ended the case. Next it was my turn, and I was also preparing the lesson by myself. After preparing the lesson, everyone came to listen to my lesson, but it was also over after a few words of comments. I was actually expecting other teachers to go deeper: What were my strengths? What was my weakness? I really wanted to make my mind map lesson better, but it seemed like the current discussion was not deep enough. (IVXB-0726-1627)

With respect to teacher collaboration, Celine still wrestled with the problem of "insufficient communication" (see Celine's Narrative Accounts in Chapter 4, p. 78). She acknowledged that teachers' friendly relationships were the basis for sharing knowledge and exchanging experience, but she also thought that sometimes an overemphasis on relationships could hinder deeper communications:

> I think we were embarrassed to point out other people's problems, we didn't want to affect our usual friendly relationships […] In fact, I didn't mind (being commented on) at all, but I felt that if I commented on others' teaching too frankly, other teachers may not like me very much. (IVXB-0726-1928)

In Celine's view, strong friendships with teachers could lead to a focus on maintaining relationships rather than on a goal of teaching improvement. She would have liked to see her and her colleagues regard teaching reform as a shared goal, and as a catalyst for deeper thinking and dialogue.

Keke was also aware that she did not communicate deeply enough with her colleagues, which she attributed to teachers' busy work schedules. She thought the case lessons could have been "polished more finely" – an ideal teacher collaboration resting on deep collective communication would have provided clear guidance on how to improve the way in which teachers were using mind maps. However, neither the lecturers nor the

observers had reflected deeply on any problems exposed in each lesson. Keke concluded: “I don’t think we have the time to settle down and talk frequently. Although we had regular meetings and discussions in the office, I always felt that these exchanges were not deep enough” (IVKB-0721-1331). The “depth” in Keke’s eyes referred to collective reflection on *each* case, which did not materialize, due mainly (according to Keke) to inconsistencies among the teachers’ workloads: “Each of us has different jobs. For example, our group had an administrative staff, whose office was not in the same building as ours […] it took extra time for him to come to attend the case lessons. We hardly have time after class to discuss it together” (IVKB-0721-1448). Due to teachers’ inconsistent administrative responsibilities, the in-depth and targeted group discussion that Keke expected did not arise in the teacher collaboration.

Keke mentioned two types of teacher communication scenarios: office discussion and formal meetings, among which the latter was mainly initiated and organized by Lily. I observed one formal meeting of teachers. It took about 25 minutes from the time Lily announced the beginning to her announcement that it was over. The pace of the meeting was fast, and Lily spoke in a tight tone. She summarized the case lessons she had attended, confirmed the preservation of the lesson videos, and then assigned the main tasks to be done next. The meeting ended with teachers’ brief discussion of how the results of the research project would be sorted out and documented. During the whole meeting, the teaching situations within each of the case lessons was only mentioned once, when Lily casually commented that the teachers initially had too much teaching content in the review class, and thus the area of one mind map was too large, which made the students feel tired. Subsequent teachers learned from this experience and simplified the content so that students could draw a mind map for a small unit in class. I realized that such formal meetings in the teachers’ research project played more of a role in maintaining the formal nature of the project and advancing the project process than in discussing pedagogical issues. I shared my feelings with Lily and received her response and explanation. Lily said:

> Indeed, as you can see, our formal meetings were used for periodic conclusions […] there was so little time for all the teachers to gather together, I could only use these formal meetings to quickly move the process forward and plan new tasks. [...] after a case lesson, we teachers would walk back together from the classroom to the office. We discussed more teaching issues while walking in the corridor, and the discussion time might be longer than in a formal meeting. (IVHB-0720-3202)

In recognizing the lack of a common time for teachers, Lily mentioned the example of walking in the corridors. She argued that these random interactions were more relevant to teaching improvement than the formal meetings. However, such communication scenes were not every teacher's experience. Although the randomness of the exchanges could ensure greater authenticity in discussing teaching problems, the same randomness meant that not all teachers could benefit, thus the likelihood of collective progress with respect to the mind mapping pedagogy was diminished.

Unlike other teachers, Yingzi believed that she had "no regrets at the moment" in this research project. She also perceived the formality of the project, but she saw it as a guarantee of its completion. Yingzi originally had some concerns about participating in the project, but under Lily's leadership, the step-by-step procedure made Yingzi feel clearer about its goals. As she said:

> Initially, I was worried that I would not be able to finish the project. [However,] the tasks Lily assigned were very clear, and she always asked for the opinions of every teacher. Before each formal meeting, she discussed her ideas with me, and then ask me whether I was satisfied with the tasks she assigned […] I felt that she took care of me. I also felt a sense of accomplishment watching the project progress step by step to where it is today, so I did not have any regrets. (IVWB-0703-0610)

Yingzi believed that what she valued most in the collaboration was the relationship with other teachers, and she felt joyful to spend time with the group. She did not have the same strong drive to improve her teaching as did Celine, so she did not share many ideas on

teaching improvement. What was important for her was that, in the process of collaboration, her initial motivation for joining the project – her trust in Lily and her interest in the project content – was responded to. Lily led her through the research process, which made her gain new experience, so she felt satisfied.

Limited Supports from the School

Celine valued the significance of the teachers' collaborative project, but she felt that it did not receive enough support from S school: "Those of us [project members] who had no research experience could only explore by ourselves, such as look up information online or ask other teachers with research experience for help" (IVXB-0726-2330). While Lily had to rely upon the help of her urban teacher friend, Celine often sought help from her teacher friends when she encountered problems in the research process. Moreover, Celine felt that the school arranged so much "extra" work for her that she had to devote much of her time outside the classroom to administrative tasks from the school, such that the research project became "a separated issue from daily teaching" that was not really taken seriously by the school. By "a separated issue from daily teaching," Celine meant that the project did not become the object of frequent communication, not like the Chemistry teachers' discussion of daily teaching, nor did it receive the same collective attention from teachers as did daily teaching. Celine also actively participated in various teaching competitions and activities at the county and municipal level, therefore had many opportunities to sit in on open classes of urban teachers in Liuzhou. By comparing her collaboration experience in S school with her learning experience in the city, she found that S schools did not foster an atmosphere of frankness for teachers to discuss teaching problems when observing one other's lessons (see Celine's Narrative Accounts in Chapter 4, p. 81) which was why she believed S schools underperformed urban schools in fostering a culture of teacher collaboration.

Yingzi's narration also reflected on the absence of the school in supporting teacher collaboration. She evaluated the role of schools as "only about the process," commenting that schools played the role of "submitting teachers' application materials to the Education Bureau

in the name of the school" as well as "providing a place for teachers to hold group meetings." The availability of meeting space was not constant, however. As Yingzi said, "Applying for a meeting room can be troublesome, as you have to find someone to hold the key, someone to turn on the electricity" (IVWB-0703-1212). As the meeting room was not always available, the time originally agreed upon by the research group members were often changed. Yingzi concluded that the role of school in their collaboration was "very limited."

Although Liang was not a member of the Chemistry teachers' research project, she nevertheless played the role of marginal contributor. Her knowledge of the subject came from being present when Chemistry teachers discussed the project in the office and being willing to give some advice. She contrasted the teachers' research project with her own experience of teaching and participating in research in an urban school for many years, pointing out that "I rarely saw the S school leader providing information to teachers" (see Liang's Narrative Accounts in Chapter 4, p. 67). As described by Liang, in the absence of school support, teachers could only rely on their own connections with one another, resources on the Internet and their previous knowledge concerning solving teaching problems. The research project that Liang had participated in the city was initiated by the teaching and research staff of the Education Bureau, whose theoretical knowledge was of great help to her. Liang thus realized that the S teachers did not receive such guidance, and they could only make progress by comparing practical experience from one other's case lessons. According to Liang, the scarcity of theoretical guidance made the collaboration relatively inefficient, with improvement of practice being limited.

Lily's stories echoed Liang's comments. Lily shared that due to her lack of technical knowledge, her case lesson was not as good as she expected. Lily's case lesson was scheduled at the beginning of the semester, and she did not have much experience of other teachers to refer to. Instead, Lily watched many online teaching videos on how teachers used mind maps interactively. However, she found that her own mental design for the mind map did not appear on the computer the way she thought it would. Lily said:

> I did have some teaching ideas, and I designed my mind map in advance, but I realized that the proportions of the computer screen didn't seem to suit it. [...] I didn't have much technical knowledge, so I had to adapt myself to the software on the computer. In the end, I just drew an ordinary mind map instead of the clearer and more intuitive picture I had designed. I can't say I didn't do well, but I think it could have been better. (IVHB-0720-1734)

In the absence of theoretical guidance and technical expertise, teachers like Lily could only turn to their original learning pathways, with the hoped-for teaching effect being not as expected.

The Expectations for Future Collaboration

In this part, I will present individual teachers' expectations for future collaboration, having experienced their collaborative research project. Importantly, teachers' stories about expectations can reveal how their past experience "leads to an experiential future" (Clandinin & Connelly, 2000, p. 2).

Lily mentioned that she had hoped to see a successful completion of the project, which would amount to a meaningful conclusion of her first time being project initiator. After the high school entrance exam, she collected the students' mind maps for archiving, and the students' works filled a whole file box. She was pleased with the archive because she saw the work as "the result of a collaborative effort by our teachers," and looked forward to the day when, the project over, she could discern her own experience of learning together with other teachers through those rich teaching materials. In addition, she wanted the research project to be transferable. As a teacher of Chemistry and Biology concurrently, Lily felt that mind mapping fit with students' thinking and thus had the potential to be applied in other subjects, like Biology. As she said, "Our Biology textbooks also have a large amount of images […] I think Biology may suit mind maps better than Chemistry. I hope our teachers can do a similar subject of biology together" (IVHB-0720-1956). Lily's expectations demonstrated that she felt a strong sense of self-fulfillment from leading the collaboration, and she hoped to

conduct a new project with the same group of teachers.

Keke upheld her student-centred teaching belief: “The ultimate goal of our teaching improvement is to give students better access to knowledge” (IVKB-0721-2821). Her expectations for future collaboration were closely tied to her self-growth as a teacher in supporting student development. Keke hoped future teacher collaborations would have a deeper impact on her pedagogy. For example, in the case lesson in the current research project, each teacher had only one lesson, while Keke wished to contrast two case lessons. “I think collaboration is supposed to lead to progress, but if I don’t compare, how will I know if I’m doing better? I hope that the next time I do this kind of research project, I can teach two lessons in different classes and record them to see whether I have made progress” (IVKB-0721-1453). In addition, she craved for future collaboration with more concentrations on students: “I hope we can learn more about our students’ knowledge basis before we move on to case lessons. Our teachers taught different classes of students, and those students may not all know well about mind maps, so the teaching effects were uneven. It would be better if we paid more attention to what our students need and then worked together” (IVKB-0721-2731). Keke felt that the attention she paid to her students during the project did not comprise part of a *common collaborative* focus, and that in future teacher research, a focus on students would be more present.

Celine’s expectations were more ambitious. As mentioned earlier, she confirmed the value of mind maps on her own practice, but she did not feel the profound impact of mind maps on the entire research group, so she hoped that she could draw a comprehensive mind map that would cover the whole Chemistry textbook. Celine said:

> I think mind mapping is worth studying, but we did not spend enough time brainstorming […] I really hope that we can spend more time to finish one thing together in the future, that is, to sort out the twelve units of the whole Chemistry textbook from beginning to end, and make a learning template in forms of mind maps for each unit, which will be our collective achievement […] In the future, we can use

> these templates for teaching every year, and maybe we can modify them every year... It is impossible for me to do on my own, so I expect to complete it with our collective power. […] In […] designing a template together, everyone will give full play to their own strengths, and the results will definitely be better. (IVXB-0726-2643)

Celine's voice was full of joy when she envisioned the future. The more she elaborated her plan, the more she felt the feasibility of such a future project, resting on the hope that teachers could contribute their different knowledge to their future collective work.

Yingzi was grateful for what she had learned from the research project. She believed that she had received the opportunity to fill in her knowledge gaps through learning from other teachers, such as how to follow the procedure of a research project, and how to deal with technical issues on the digital whiteboard. Her hope for future collaboration was to sustain her friendly relationships with her colleagues. Yingzi said: "I can always learn as long as I'm around other teachers. They are good at their classes and are more careful than me. Every time after I listened to their case lessons, I tried to imitate some of their teaching skills in my own class. I hope we can all continue to work in this friendly way in the future. […] I look forward to sharing what I know with younger teachers to help them solve their teaching problems." In Yingzi's eyes, collaboration was more about give and take in teaching skills and knowledge, and her expectations were that collaboration would help maintain these relationships.

Chapter Summary and Discussion

In this chapter, I presented teachers' stories about their motivations, perceptions, obstacles and expectations on and around their project collaboration. Before I began to capture teachers' real and cover stories from their accounts, I turned back to the interwoven connections between the two stories, as envisioned by Olson and Craig (2005): "cover stories … are constructed when incommensurable gaps or conflicts between individually and socially constructed narratives emerge" (p. 162). While the real story, according to Crites (1979), "though never avowed, is the one that is actually believed and acted upon" (p. 126).

As teachers' individual narratives and their narratives about the group are so closely interlaced, I will first discuss what stories teachers really believe – teachers' *real stories* – and then reveal what stories suppress the telling of real stories – teachers' *cover stories*.

The first theme that emerged from teachers' narratives is the togetherness and a spirit of reciprocity among teachers in the research project. For instance, Yingzi's trust and reliance on Lily's leadership role, the suggestions Keke received from other teachers in her case lesson, and the "base camp" metaphor – these stories depict a friendly and united teacher group. However, Celine's stories suggest that these stories of friendliness may inhibit the expression of her real story. In Celine's view, teachers' excessive concern with harmony prevented them from further debating their teaching ideas and beliefs. Since the debate risked destroying the harmonious atmosphere, Celine became afraid to be completely honest in collaboration. Even in the case of lessons, she still spoke her true feelings, but in a selective and reserved way. For her part, as Keke realized her need to further discuss teaching strategies used in case lessons, she increasingly saw as inadequate teachers' current ways of implementing the project. Keke found her need for deeper communication failed to be satisfied in the occasional discussions advocated by Lily, nor did she encounter sufficient time for discussion in formal meetings accompanied by time limitations. Their real stories reflect that the discussions and reflections on the current project were insufficient. The teachers' excessive maintenance of the solidity of their relationship is the cover story that prevents real versions of stories from being publicly expressed. Celine and Keke's genuine feelings about the research project compromised with their sense of belonging to the office group, so they used "superficial" to imply the shortcomings of their current collaboration.

The second theme of the real-cover stories relates to the student-centred goal of the project. At the beginning of this project, Lily started from the phenomenon that students felt bored in class and tried to improve teachers' review strategies through their research project. However, as the project progressed, this motivation was gradually forgotten by teachers; in other words, the student-centred focus was dwindling. In implementing the project, teachers

did not develop a mind-mapping teaching method centred on students' perspectives. Instead, they tried some changed teaching methods based on their own past teaching experience and their knowledge of mind maps. Students' mind mapping had not received enough attention from teachers. Keke said bluntly: "Our project itself was about students' engagement and positivity on class, but in the end, we just finished watching each person's last class and did not seem to be looking too much at what our students were doing during the class." Keke also expressed in her expectations of future collaboration: "I hope we can learn more about the students' knowledge foundations before we move on to case lessons" (IVKB-0721-1453). Yingzi commented on the mind mapping works completed by her students: "Some students were perfunctory – they drew the maps merely to complete the task" (IVWB-0703-1456). Improving students' learning status was originally the motivation of the project, but teachers gradually ignored it – teachers' student-centred focus was dwindling, which is the real story told by teachers. The cover story that suppressed this real story came from the research group's tacit acceptance of mind mapping as an alternative teaching scheme – when teachers selected mind maps as their research objects, they acquiesced that mind maps already represented a student perspective. Since the completion of the project was given a higher priority, and telling these real stories may imply a negative evaluation of the current research project (such as teachers' tight research schedule described by Keke and Lily), the real stories about students' perspectives were not discussed publicly.

The third discussion concerns the formal nature of teachers' research project. In Lily's stories, she always believed that "beneficial collaboration should rely on subtle daily efforts." Conflicting with the "daily efforts" she advocated were the *formal* processes necessary for the project, such as meeting in a conference room to take photos of teachers, even though teachers might have conflicting schedules; students' work must be documented by teachers, even though teachers believed that returning students' mind maps to them would be more helpful for students to review. In Celine's view, these processes are some "separated issue[s] from daily teaching," which hints at the incongruity of these processes with teachers' daily

routine and the potential for additional burden on teachers. Yingzi's accounts reveal why teachers accept this incongruity: "These formal materials are necessary to complete the project" (IVWB-0703-3303). Formal materials refer to teachers' meeting notes and students' work. As all teachers have explicitly pointed out, a crucial reason for participating in the project is that teachers must submit research-related materials to strive for opportunities to promote their professional titles. The evaluation system of teachers' professional titles endows these formal processes with legitimacy. Teachers feel that they are at a disadvantage in their knowledge of teacher research (as revealed by Liang's narratives – she believed that her own and other teachers' "theoretical" knowledge is insufficient), and therefore rely on the formal process to ensure that they are on the right track as expected by the evaluation system. This is a cover story authored by the rules of teacher's professional promotion, perpetuated by its "normalizing force" (Ritchie & Wilson, 2000, as cited in Olson & Craig, 2005, p. 165), making it difficult for teachers to speak up when they feel contradictions.

Chapter 6 - Discussion

In this chapter, I will further discuss the stories of Chapters 4 and 5, combining the discussion of *real stories* and *cover stories* by Olson and Craig (2005) as a reflexive theoretical tool. At the same time, I will further situate my research within the literature on teacher collaboration. As advocated by Clandinin and Connelly (1994), researchers should not stop at telling the participants' stories, but also help the stories serve the community and others in a wider sense, so as a kind of "writing for others" (p. 425). My writing of this chapter is also a process of trying to respond to my original curiosity and motivations that brought me to these teachers' narratives – What did I, as an inquirer with research goals, perceive in the teachers' stories? What caught my eye? How can my research respond to other scholars' views on teacher collaboration?

Teachers' Strong Commitment to the Group

Sources of Commitment

In the stories of teachers' daily collaboration and their research project, what stands out most is the close relationship between, and emotional connections among, teachers, which I call teachers' strong commitment to the group. Reviewing the teachers' stories, I found three sources of this commitment: 1) teachers' common minority identities and similar living circumstances, 2) their shared recognition of the limited resources available to them in Sanjiang County, and 3) teachers' complete acceptance of the office relationship.

The common ethnic minority identities and living environments of the teachers made their identification with the "Chemistry teachers' group" go beyond a typical professional relationship; rather, it became a deep connection with emotional roots. This was reflected in Liang's stories of how she developed friendships with other teachers by learning about their eating habits. When Liang entered S school as a new teacher unfamiliar with the habits of the Dong ethnic group, she wanted to "take root" in Sanjiang as her father advocated, so she began to learn about the local crops and food and to experience the life of local teachers. Subsequently, Liang learned the customs and norms of the Sanjiang teacher community, such

as the expression “eating oil tea” instead of “drinking oil tea,” which built a foundation for her to be accepted by local teachers (see Liang’s Narrative Accounts in Chapter 4, p. 62). Yingzi was also a key player in fostering rapport among the teachers. For example, after noticing Liang’s interest in local wild bayberries, Yingzi spent a weekend picking bayberries from her farm and bringing them to the office to share with Liang. These stories demonstrate that Yingzi was a teacher who emphasized harmonious relationships with her colleagues, not because she regarded being friendly as a kind of teacher’s professional norm, but because she recognized her colleagues as worthy friends. Moreover, she could also obtain emotional fulfillment from such harmonious relationships (see Yingzi’s Narrative Accounts in Chapter 4, p. 85).

In addition to the stories that emerged from the interviews, I also directly observed friendly interactions among teachers. All the local teachers in the Chemistry office could play the Dong pipa, a guitar-like ethnic instrument designed by the Dong people. There were two Dong pipas in the office, which belonged to Keke and Yingzi. When they worked overtime in the office, instead of going home for lunch breaks, they occasionally played the Dong pipa and sang in the Dong language. The songs were familiar tunes to the Dong people, so even if teachers did not tell each other which song they planned to sing, when one person started singing, the other person would soon join the chorus. Teachers did not deliberately organize such activities to promote friendship. By contrast, eating, playing and singing constituted a natural, spontaneous part of teachers’ ongoing life in S school. In these moments, I was often deeply touched by the teachers’ interactions and their sincere emotions.

In the stories of the teachers along with the interactions I observed among them, a common emotional foundation emerged among Chemistry teachers, this based on their similar life experiences, ethnic identities, and sincere emotional exchanges. It was a collective feeling that transcended professional boundaries and permeated daily interactions, allowing teachers to get to know each other, not just one other’s teaching experience, but their lives before they entered the office, which constructed a strong foundation of trust and

emotional commitment to the group.

The second source of teachers' commitment was their shared recognition of the limited resources available to them. For instance, in one of Liang's stories, Yingzi was about to go to Liuzhou City to participate in a teaching competition. Since Yingzi had lived in the county and countryside for a long time, she was unfamiliar with the evaluation method of urban schools. Then Liang shared a video of her city colleague with Yingzi, supporting Yingzi in familiarizing herself with the requirements of the competition (see Liang's Narrative Accounts in Chapter 4, p. 62). In another case, when Lily was going to participate in a class recording competition, Celine, Yingzi and Keke all played different role — helping with the video recording, providing feedback, and adding subtitles to Lily's video. As the school failed to announce official information about those competitions, Celine played another critical role as a deliverer of the competition's deadlines (see Lily's Narrative Accounts in Chapter 4, p. 92).

In these stories, it became evident that it was difficult for teachers to complete their work independently due to limited technical support and information channels, while the existence of the group provided them with a shared knowledge repertoire. According to Little (1990), "to the extent that teachers find themselves truly dependent on one another to manage the tasks and reap the rewards of teaching, joint participation will be worth the investment of time and other resources. To the extent that teachers' success and satisfaction can be achieved independently, the motivations to participate are weakened" (p. 523). Even if teachers did not always rely on the group and sometimes made up for limited information resources through their own personal contacts or web searches, the presence of the group served as a stable information channel and source of support, and teachers, in benefitting from it, made a reciprocal commitment to the group.

Finally, the complete acceptance of the office relationship was also a source of teachers' commitment to the group. The metaphor of "Base Camp," first coined by Yingzi, was the most powerful illustration of this acceptance (see Yingzi's Narrative Accounts in

Chapter 4, p. 87). All five teachers shared the same office, but geographic proximity alone did not necessarily lead to a sense of identity and belonging to a group. When the metaphor of "Base Camp" appeared, the meaning of the office changed. Due to the arrangement of the school, some young teachers who were originally in the Chemistry group had been placed in other offices, however because of their closeness to the chemistry office, they would return to the base camp to visit older teachers such as Lily and Yingzi. Yingzi evaluated this phenomenon as teachers' "nostalgia" for the base camp. Therefore, teachers' acceptance of the office relationship made it not merely a workplace but as an emotional base for group activities, which also helped teachers identify boundaries between who are the "own people" (*zijiren*) and outsiders (see Liang's Narrative Accounts in Chapter 4, p. 65), such that the office became a safe and trustworthy environment.

Implications of their Commitment on Teacher Collaboration

Once I become aware of the existence of teachers' perceptions of and commitment to their group, I sought teachers' stories about the role that the group played in teacher collaboration, and whether and how it affected teachers' collaborative activities.

First of all, trust in the teacher group provided teachers with a foundation for honest communication, such that the sharing of teachers' individual stories could become a consensual practice among the group. The teachers' small talk provided an example. Cochran-Smith and Lytle (1993) emphasize teachers' talking with one another, believing that such behaviour allows teachers to reflect on their experiences, exchange stories with each other, and access a more general picture of education and student learning. As they argue, "stories swapped casually acquire more significance when recalled in a different context; advice sought and received may solve an immediate problem, but it may also percolate for a time and then reappear as a different kind of question. In communities for research, teachers use small talk to enter into one another's frames of reference" (p. 94).

In my research, teachers' trust and sense of belonging to the group proved indispensable for them to have small talks in the office rather than keeping silent. For

instance, Lily recounted a time when she brought the learning difficulties of her students back to the office and received practical, timely suggestions through small talks with other teachers, which subsequently influenced her teaching (see Lily's Narrative Accounts in Chapter 4, p. 95). In the Chemistry teachers' research project, small talk in the office also played a crucial role: through occasionally voiced complaints, teachers found that their students' burnout in review sessions was a common problem of Chemistry teachers, so they produced the idea of addressing the problem collectively.

Teachers' group commitment also motivated teachers to work jointly rather than remain isolated within the school. Keke's story of teachers' sharing their teaching materials in the office demonstrates that tendency (see Keke's Narrative Accounts in Chapter 4, pp. 73-74). In the Chemistry teachers' office, there were thick stacks everywhere of teaching materials printed out by teachers. When a teacher found some useful question banks from the Internet, she would inform other teachers and let everyone have a copy. This sharing behaviour was not only rooted in the goodwill of teachers. As Little (1990) suggests, though sharing among teachers can expand "the collective pool of resources" (p. 519), such a practice may not always be promoted in schools due to the inherent need of teachers to maintain privacy. However, the teachers' group commitment made the reciprocity of sharing generally accepted, overcoming a tendency to guard or hoard their resource reserves.

So far, I have emphasized the positive conditions of the teachers' group for teacher collaboration, including that it created a foundation for trust and emotional connection, helped teachers form a collective motivation for collaboration, and provided a safe space within which to exchange experiences. However, whether such conditions can eventually form some kind of beneficial form of teacher collaboration, I take a more cautious attitude in the next part in considering the double-storied structure.

Teachers' Collective Stories: A Cushion between Cover Stories and Real stories

Clandinin and Connelly (1996) adopted the metaphors of 'conduit' and 'professional knowledge landscape' to describe the different stories experienced by teachers, inside and

outside of classrooms. The metaphor of landscape emphasizes the breadth of teachers' knowledge as anchored in their practice, including teachers' actions inside the classroom and their relationships and interactions in the wider community. As metaphor, 'conduit' suggests the tensions between theory and practice, and is used by Clandinin and Connelly (1996) to point out that teachers' thinking outside the classroom is often permeated and influenced by theoretical knowledge external to their classroom life, which constitute sacred stories. To reiterate, sacred stories (also called cover stories) are prescribed stories that take precedence over teacher practice. Contrary to sacred stories are teachers' "secret stories" (Clandinin & Connelly, 1996, p. 25), which are confined to the privacy of the classroom, and often conflict with the stories outside, namely with sacred or cover stories. The distinction that Clandinin and Connelly draw between these two places/stories inspires me to re-examine a particular place of my participants' school life: the office shared by the Chemistry teachers. The shared office is a common office planning space in Chinese public schools. In S school, Chemistry teachers shared and exchanged their individual lived stories in the office, so I inferred that for the teachers of S school, it was also likely that the secret and safe places for teachers in S School were not only their classrooms, but also the shared office. However, the word "shared" itself implies a paradox (with use of the word, secret), so I have spent some time rethinking the nature of the stories that teachers told in the chemistry office, and whether or how these stories might lie on a kind of continuum between sacred stories and secret stories, or between cover stories and real stories, as discussed by Olson and Craig (2005).

I first revisited the collective nature of teachers' stories in the office, which was their most salient feature, because they describe the characteristics of chemistry teachers collectively rather than the stories of individual teachers. When "we" and "our" appeared in teachers' narratives, there could be possibilities of *collective* stories demonstrating themselves, such as "we are a united team" by Lily, "we are a group of people willing to share their outcomes" by Keke, and "we are a group of people who care about each other" by Yingzi. These stories were rooted in the group of teachers, in the commitments and identities

of the teachers to the Chemistry subject group, such that a voluntary coherence was embedded in those stories, including the coherence between different teachers' collective stories, and the coherence between collective stories and teachers' individual stories. Because of this coherence, I find it difficult to identify subtle differences between the collective stories told by *different* teachers. Alternatively, I examined the narratives told when teachers distanced themselves from the collective stories but were not completely free from their influence, which may occur in the moment when they narrated "I" and "they." Through this process, I discovered some characteristics of teachers' collective stories and identified where these might fit into the double-storied structure.

On the one hand, in the research, collective stories overlapped with teachers' real stories. Collective stories formed the frame of reference for teachers' actions in schools, influencing their practices in and out of the office, as well as in and out of the classroom. In Celine's narratives, she believed that the office was shared by a group of responsible teachers, which made her feel a positive impact, and she regained her passion for teaching (see Celine's Narrative Accounts in Chapter 4, p. 78). Yingzi's experience of sorting out instruments with two other teachers in the chemistry laboratory made her feel the pleasure of working with colleagues. In the subsequent research project, she expressed her altruism and willingness to share knowledge; that was actually how she had always acted in her ongoing school life (see Yingzi's Narrative Accounts in Chapter 4, pp. 86-87). These collective stories inspired (rather than obscured the view of) teachers' real stories, just as through teachers' acceptance of the office relationship, some of the collective stories were likewise internalized as the real stories of teachers. Teachers' previous experiences and personal dispositions were the blueprint and soil for the collective stories to be integrated into their real stories.

On the other hand, collective stories were just as likely as cover stories to inhibit teachers from telling their real stories. When Celine's desire for a teaching debate in the office made her suspicious of the shallow level of collaboration in the office, she began to perceive that the support in the office was "insufficient" and "inadequate" (see Celine's

Narrative Accounts in Chapter 4, p. 78). While the collective stories informed the emphasis on the benefits of harmonious relationships in the office, it was hard for her to tell the real stories that lay beneath. The stories of Yingzi's motivation to participate in the research project provides further evidence of the metaphor of the conduit. Yingzi did not really appreciate the degree of her internal motivation for participating in a research project, and how closely it was tied to aspirations for her teaching development. For Yingzi, it started out as part of enhancing one's professional title, a normative requirement removed from her personal professional landscape. When Lily and other colleagues brought the research project into her vision, she retold the story of accepting a collective goal, "it was really good for me to participate in the project," even if she did not adopt a new teaching method in her case lesson different from her usual teaching.

I use the metaphor of cushion to describe the collective stories in my research because these collective stories alleviated tensions between the real stories and cover stories, even as they 'cover' real stories, but more covertly. When Celine was inspired by a collective story about her office colleagues being dedicated, she embraced the collective story and acted upon it. When teachers embraced collective stories, the legitimacy of the cover story was maintained; given a conflict between teachers' real stories and cover stories, teachers would suppress the real stories and instead accept collective stories. In Celine's case, she would not share about her desire to heatedly debate with her colleagues because "teachers should get along with each other"; Yingzi would not tell a story that she did not fully understand the mind mapping method, because the *collective* had already made a choice and she trusted the *collective*. In retelling collective stories, teachers' personal agency was thus diminished and substituted instead by a collective agency (Olson & Craig, 2005); teachers would rather choose the collective story as representative of their personal will, this when faced with an impending contradiction between real and cover stories. In such situations, the conflict between the real and the cover stories became attenuated, so I name the collective stories as *cushions* positioned between real and cover stories.

A Lack of Inquiry in Teacher Collaboration

Borrowing Cochran-Smith and Lytle's arguments on teacher research, in this section, I review the Chemistry teachers' research project as a case of teacher collaboration, and discuss why the teacher collaboration did not really form an *inquiry* community of teachers as advocated by Cochran-Smith and Lytle (1993, 1999).

The collaboration-based research project of Chemistry teachers in S school promised to provide a foundation for the growth of "cultures of inquiry communities" (Cochran-Smith & Lytle, 1999, p.294). As Cochran-Smith and Lytle (1993) argue:

> Teacher research is concerned with the questions that arise from the lived experiences of teachers and the everyday life of teaching expressed in a language that emanates from practice. Teachers are concerned about the consequences of their actions, and teacher research is often prompted by teachers' desire to know more about the dynamic interplay of classroom events. Hence teacher research is well positioned to produce precisely the kind of knowledge currently needed in the field. (p. 59)

A teaching quandary appeared, provoking the teachers' desire to explore – to find an alternative way to make up for the present deficiencies in the existing Chemistry review sessions. The deficiencies referred to teachers' repetitive teaching methods in Chemistry review sessions, and consequently students' exhaustion and negative attitudes. The interwoven lived experiences and frequent conversations of teachers in the office made it possible for teachers to construct knowledge jointly. A teacher inquiry community began to take shape. As each teacher in the research project group completed their case lessons, teachers' deep discussion of their lessons, though, did not seem to be stimulated, and the gain stopped short of what it could have been. For instance, Celine described the limited feedback she received after her case lesson: "it was over after a few words of comments"; she concluded that these comments were "insufficient communication", hindering her from fully expressing her views on others' teaching and hearing enough helpful suggestions from others on her own teaching. Teachers also reported that their gains from the project came mainly in

the form of learning technical skills of how to integrate mind maps (such as in Keke's stories) and experience with a research project process (such as in Yingzi's stories). By contrast, the informal conversations of teachers as they walked together in the corridors after case lessons, this described by Lily, instead created opportunities for teachers to reflect deeply on their lessons (*Chapter 5 – The Superficial Collaboration*). However, due to the fragmentation of those conversations and the fact that not all teachers could participate, the in-depth discussion these conversations could bring was limited to only some teachers. These limitations are similar to what Hargreaves has called bounded collaboration:

> [Bounded collaboration is] restricted in its depth, in its scope, in its frequency or persistence, or in a combination of these things. It is collaboration which does not reach deep down to the grounds, the principles or the ethics of practice, but which sticks with routine advice giving, trick trading and materials sharing of a more immediate, specific and technical nature. It is collaboration which does not extend beyond particular units of work or subjects of study to the whole purpose and value of curricular and pedagogical judgment. It is collaboration which focuses on the immediate and the practical to the exclusion of longer-term planning concerns. (Hargreaves, 1989, as cited in Lytle and Fecho, 1991, p.24-25).

As Lytle and Fecho (1991) suggest (building on Hargreaves), while the exchange of materials and routines can produce substantial teacher learning, if teachers' communications lack "depth and reciprocity" (p.25), their enthusiasm and interest in a project may wane and drift away from the desire for research that brought them here in the first place. This is precisely what occurred in the research with respect to the teachers' collective project and case studies.

Next, I turn to probe further the reasons why an inquiry community did not emerge out of the Chemistry teachers' research project. Cochran-Smith and Lytle (1993) have placed considerable emphasis on the supportive role of *time* in teacher research, arguing that "when the pace of a community's work is unhurried and members of the group make a commitment

to work through complicated issues over time, ideas have a chance to incubate and develop, trust builds in the group, and participants feel comfortable raising sensitive issues and risking self-revelation" (p. 91). In the Chemistry teachers' research project, it was difficult to guarantee the reasonable allocation and organization of teachers' time. As Keke said, teachers enjoyed different tasks outside the research project, which made it hard to find the time for ongoing group discussion. Even if there was time, for instance, the formal meetings organized regularly by Lily, they were often no longer than half an hour, and served more to advance the progress of the project (in a formal, reporting kind of way) than to stimulate teachers' discussions and debates.

Although Liang was not formally involved in the project, she often participated in discussions with other Chemistry teachers in the office. She once told me how she felt about the teachers' dilemmas in the research project: "We are all people with rich teaching experience, but we cannot raise our experience to the theory by ourselves. […] so we can only rely on our own exploration without theoretical guidance, and sometimes the progress of research was slow" (IVLA-0703-2004). Liang used the expression "raise experience to the theory." In her mind, the dual status of theory and practice referred to the guiding role of theory; that theories need to be mastered through some learning process such as teacher training. Liang's view of theory and practice is captured in Cochran-Smith and Lytle's (1999) "knowledge-for-practice", namely, that teachers will look for normative knowledge beneficial to their teaching. The actions of the Chemistry teachers also reflected this view of knowledge. They assumed that there was a knowledge base about mind mapping and about "how to do research" that needed to be learned in order to support their project. Teachers' beliefs that their actions without such knowledge were groundless prevented them from reconstructing their practice *through* the research project.

Such a view of knowledge can lead to teachers' distrust of their own knowledge. It reinforces teachers' beliefs in the inadequacy of their knowledge and experience, forcing them to instead seek this knowledge through the Internet and contacting their teacher friends.

Thus, teachers relied on the normalized process of the research project (as discussed at the end of Chapter 6) and advanced their project based on the formal process rather than according to their real stories. In contrast, teachers described more supportive collaboration and steady mutual support in their narrative accounts in Chapter 4. As I look back on the stories in Chapter 4, I realize that in collaboration, whether it is occasional (such as Keke's story about teachers discussing an exam question) or planned (such as Celine and Yingzi's experience of jointly supporting Lily to complete her class-recording competition), teachers could critically express and accept each other's views. For instance, Celine mentioned that informal discussions among teachers in the office were tolerant of different opinions. In these cases, teachers acted more based on their real educational beliefs, and their real stories were less suppressed by cover stories than in the formal research project – teachers could more effectively support each other when their real stories were openly expressed in the office.

Finally, I return to the group commitment of teachers mentioned at the beginning of this chapter. I believe that even though the Chemistry teachers' shared office provided a safe environment for discordant explanations and animated debate, teachers did not take advantage of this place to develop a culture of inquiry community in which reflection, questioning, and challenge about teaching became part of their teaching routines. The view of knowledge advocated by Cochran-Smith and Lytle (1999), namely, a knowledge-of-practice, assumes that teachers "make problematic their own knowledge and practice as well as the knowledge and practice of others and thus stand in a different relationship to knowledge" (p. 273). To form a culture of inquiry community, teachers should develop a tendency to challenge their own teaching beliefs, the knowledge their students are expected to learn, and even the education norms in the school and in the community. In the case of Chemistry teachers' research project, such questions would have been transposed into their doubts about the use of mind maps, their reflections on the challenges of incorporating mind mapping, and questions about their way of advancing the project, however these questions did not materialize.

Teachers were not uninspired by the invitation to “make problematic their own knowledge and practice” (Cochran-Smith and Lytle, 1999, p.273). For example, in Keke’s narratives, she perceived a weakening in the student-centred focus in the project, so she called for the return of a student perspective, and advocated for a comparative research mode that could help teachers to surpass their previous teaching methods. Celine’s vision of teaching reform was even stronger. She was attracted by the fierce debates of urban teachers in the open class, and therefore hoped to bring such debates on teaching methods back into the discussion of this project. However, the over-maintenance of harmonious relationships in the teachers’ commitment to the group prevented the development and realization of these challenging ideas, and because teachers accepted the collective stories in the office without perceiving their feelings and desires as real stories, or chose not to tell those real stories, the formation of inquiry community in teacher collaboration was inhibited.

Chapter 7 – Conclusion

This research used teacher stories as a lens to explore the experiences of Chinese teacher on professional collaboration and the impact of their stories on curriculum improvement. The narrative inquiry method of Clandinin and Connelly (2000) and Olson and Craig's (2005) double-story structure provided the methodological and theoretical foundations for my research. I gathered, sorted and analyzed the stories of five secondary school Chemistry teachers working in a school in Sanjiang County in southwest China. In this chapter, I return to my research questions. I also reflect on my own role as a researcher, discuss the limitations of my research and its implications for future studies.

Review of Findings

My interests and initial review of the literature prompted me to ask three research questions: 1) What are the real stories told by teachers about teacher collaboration? 2) What are the cover stories told by teachers about teacher collaboration? and 3) How do different stories told in and of teacher collaboration enhance or hinder curriculum improvement? I respond to each question in turn.

What are the real stories told by teachers about teacher collaboration?

Based on teachers' narrative accounts, teachers' strong emotional connections and commitment to the Chemistry Subject Group constituted their real stories of teacher collaboration. In Liang's narrative accounts, for example, the real story lay in how she was accepted as part of this teacher group by learning and internalizing the customs of local teachers in Sanjiang. In Keke's narratives, the commitment of the Chemistry teachers to the group was manifested as a strong willingness to help each other and their mutual trust, enabling spontaneous sharing and supporting among teachers in the office. Celine was the exception. Celine had a need for deep discussion that could challenge her teaching beliefs. She realized that a group that exceedingly focused on friendship could not support her in obtaining genuine opportunities for professional development through collaboration. Celine's case also informed the next research question, on the existence of collective stories, which I

will discuss shortly.

The second real story is that the student-centred goal was dwindling. Lily's stories provided evidence that, at the beginning of the teachers' project, a concern for students' learning status was a crucial driving force. Teachers shared their teaching puzzles concerning review learning and found that students were not highly motivated to learn. Then mind mapping was introduced as an alternative that might arouse students' learning interests. However, in the process, the student-centred perspective gradually dwindled. For example, Keke found that teachers did not carry out concentrated analysis and discussion of students' mind maps. The teachers failed to re-examine their instructional design from the perspective of the students, thus the initial impetus for their research project was gradually forgotten.

The final real story centres on the formal nature of the teachers' research project. Different from daily and informal collaborative activities advocated by Lily and Celine, the teachers' research project had more formal requirements because related to the evaluation system of teachers' professional titles: teachers must regularly discuss matters in a meeting room suitable for photos, and students' drawing and other materials must be archived. These formal procedures were inconsistent with teachers' daily routines and placed additional workload on teachers.

What are the cover stories told by teachers about teacher collaboration?

Cover stories usually appear as the opposite to real stories, often suppressing real stories, so this question has already been partially answered in the response to the previous research question. The first cover story was that teachers' group commitment invariably proved beneficial for teacher collaboration. The formation of this cover story came from the teachers' assumption that frank communication was based on friendship. Gradually, teachers' need for frank communication was covered by the need to maintain harmonious relationships, which in Celine's stories was manifested by her choice to hold back her ideas during the feedback sessions of research projects for fear of being disliked by other teachers.

The second cover story, as already alluded to in the first question, concerned the

student-centred goal in teachers' research project. The cover story in which teachers professed to believe was that the application of mind maps would benefit students and meet their learning needs. However, Yingzi's case lesson showed how students' mind-mapping skills did not receive enough attention from the research group. This cover story initially came under suspicion and was challenged by Keke, who prided herself on attention paid to students. She believed that students' mind maps had not been fully discussed, so she hoped to enhance the conversation in future teacher collaboration.

The third cover story suppressed teachers' implicit critique of the formal process of their research project. The legitimacy of this cover story came from the evaluation system for teachers' professional titles and teachers' distrust of their own experience and knowledge. Teachers believed that they were doing research for the first time and must rely on some standardized project process, so they chose to tell the cover story that standardized measures were an effective guarantee for solving research problems; this cover story prevented them from expressing different opinions on the project.

Finally, I propose a kind of collective story of teachers that lay between a real story and cover story, rooted in the shared office. Since this collective story had the potential to suppress the real story, I think it falls partially into the category of cover story. The collective stories of teachers were presented in the thesis as an overarching narrative of the teacher group, and concerned such stories as how teachers described the group to which they belonged and how their perceptions of the group impacted their teaching practice. In Celine's case, the collective story manifested itself as the positive impact of a motivating office space, while in Yingzi's case, it emerged in her enhanced commitment to the group through the friendship of teachers. The risk of a collective story is that it seems not to be oppressive because based on friendly relationships. Nonetheless, teachers experienced difficulty telling real stories with conflict as part of a collective story, and thus this story inhibited the awareness and expressions of real stories—real stories that could have better served the goal of professional collaboration.

How do different stories told in and of teacher collaboration enhance or hinder curriculum improvement?

First of all, teachers in the Chemistry office usually brought their stories from the private space of classrooms to the office through small talk (in Cochran-Smith & Lytle' sense); small talk deepened teachers' interpersonal relationships, enhanced teachers' emotional connections, made students' conditions more public to teachers, and created opportunities for teachers' self-revelation and exchanging ideas in the office (Cochran-Smith & Lytle, 1993). Teachers' frequent communications in forms of small talk in the office created beneficial conditions for teachers to form an inquiry community culture in which to deeply reflect on their teaching beliefs, thus making curriculum improvement possible.

In my research, collective stories are a variant of cover stories. Collective stories function as a *cushion* that alleviates the tensions between the cover and real stories. For instance, collective stories about the group of chemistry teachers make teachers inclined to pursue and maintain a friendly atmosphere so that teachers free themselves from the immediate pressure of a cover story through collective choices. Nonetheless, collective stories still suppress teachers' real stories. Even if a desire for challenging conversation existed, such as Celine's desire for debate among teachers around their teaching methods, and Keke's desire to re-examine and reflect on current mind-mapping teaching approaches, these real stories of teachers were not expressed because they risk undermining the friendly collective stories. Thus, collective stories function as cover stories, preventing teachers from creating opportunities for curriculum improvement through self-challenge.

Finally, teachers saw themselves as less knowledgeable in the formal research project, and so chose not to tell their real stories about collaboration, which made them miss an opportunity to improve their project with a more critical eye. Both Lily and Yingzi pointed out that formal meetings were not as effective as office discussions in addressing problems they found in the case lessons, but teachers also believed that these formal process were necessary to "complete the research project", so they chose to act on the cover story.

Teachers' real stories thus remained hidden so that, in the research project, teachers' mutual support proved to be less beneficial than in their daily collaborative activities, even as the teachers' research project failed to materialize and translate into curriculum improvement.

My Reflections

At the beginning of my research, though I started out with a clear purpose of exploring teacher collaboration in China, I had yet to learn what kind of teacher stories I would encounter and what kind of time I would experience with my teachers. Clandinin and Connelly (2000) attribute part of the uncertainty faced by narrative inquirers to their "knowing, and caring for, specific participants" (p.145). During the month I stayed in the S school, I lived together with my participants, and heard and retold their stories. I was also in the process of developing a relationship with them, which made my writing tend to swing between abstract theories and the concrete life of 'my' teachers (Clandinin & Connelly, 2000). Instead of getting stuck in this 'swing,' I followed the advice of Clandinin and Connelly and put all the details and stories in my notebooks. I read and re-read these stories. Sometimes I also distanced myself from them, just standing in the long corridor of S school and meditating. I realized that the ways in which teachers developed their understandings of collaboration came not from a summary of previous academic literature, as I did, but from every impromptu and informal conversation they had with their colleagues in the office, from their discussions and debates to emotional and material sharing during their school life.

After that, I adopted a more open-minded attitude to interviewing and observing teachers. I was then able to perceive the emotional connections among this office-based teacher group, emotional connections given individual interpretations by teachers and integrated into their collaborative practice. The mutual trust and dependence among teachers were beyond my imagination before I entered S school. However, when my thesis was about to be completed, I felt sorry for the lack of support from the school and external environment in teachers' collaborative activities.

Finally, I am thankful that I have adopted a narrative-oriented research method. This

research process has brought me into the real and subtle practical situations of teachers, providing me with the opportunity to approach closer to teachers' meaning construction and experiences about collaboration. I remain inspired by how dynamic the teachers are in terms of their professional development, such as Keke's concerns and empathy for her students, Celine's ambition to draw a unified mind map with all Chemistry teachers, and all teachers' commitment to the joint development of Chemistry and Biology teachers in this small school community.

I greatly value the teacher stories collected and ultimately presented in this research to better understand how teachers in China can create the possibility of professional advancement with limited resources and how a shared office could build teacher connections. I also hope my writing can be passed on to a broader education or research community and be critically read and commented on so that my future exploration of teacher stories can become more mature.

Research Limitations

There are three main limitations of my research. Firstly, influenced by the gender ratio of Chemistry teachers in S school and my choice of taking Chemistry teachers' research project as the case of collaboration in my research, all teachers who were willing to sign the informed consent form and become my participants were female. The single gender of my participants prevented my research from exploring the different choices and working conditions of collaboration by teachers of different genders.

Secondly, this research is limited in its choice of narrators' perspectives. I only chose the participants within collaboration – teachers – as the subjects of my research, but to more fully present the school conditions that produced teacher collaboration, school administrators' views on collaboration are equally worth exploring, which was not achieved in this research.

Finally, due to the time limit of my research, I could only pay short-time attention to the research project of the Chemistry teachers. If future conditions permit, follow-up research with a longer time dimension is worth expectations.

Research Implications

Implications for Teacher Collaboration in China

The study of teacher collaboration provided detailed understandings of teachers' experiences of their mutual work, especially given the narrative lens used in this thesis. The double-story structure became a highly appropriate lens to explain how Chinese teachers perceive and deal with the relationship between their self-affairs (e.g., teaching beliefs and personal goals) and group affairs (e.g., common goal, the shared tasks and shard teaching difficulties) in collaboration. The real stories in this research demonstrate the motivations behind teachers' choice to collaborate, including their commitment to collective professional development, their emotional connections based on a similar living environment, and their shared common goal formed by teaching difficulties they encountered in practice. The cover stories, however, revealed factors that prevented teachers from deeper collective inquiry, hindered by their preservation of friendly peer relationships and the lack of opportunities for teachers to problematize their shared work experience in a supportive environment (even though they seemed to have developed the awareness and capacity to do so). These findings echo Zhang and Sun (2018) on the impact of China's cultural and institutional background on teacher collaboration, wherein they argued that collectivism makes teachers accustomed to staying in touch with colleagues and caring for each other, but also makes teachers prefer limited self-expression due to conflict prevention. My research, while not fully returning to a discussion of the Chinese cultural context, has provided a nuanced depiction of teachers' collaborative activities as a manifestation of this cultural influence. In collaboration, teachers are not completely suppressed by the collective; however, the tension between the individuals and the collective is presented in the form of collective stories. Therefore, my research calls for greater attention in teacher collaboration in China to be based on understanding of this collectivist culture. At the same time, it is also necessary to further explore how teachers can conduct a dialogue between themselves and the collective, and whether there can be productive interaction between perception of a shared goal and the goal of self-development.

Implications for Teacher Education Programs

As Connelly and Clandinin (1997) argue in their discussion of teacher professional development, teachers' personal practical knowledge is developed in complex situations – their "knowledge landscape" (p. 673). My research has found that the shared office based on teachers' teaching subjects became a crucial place for teacher practice: an essential element in the Chinese public school teachers' landscape. The office is precisely a ground for teachers to accumulate practical knowledge and develop or change their teaching beliefs and knowledge through frequent interactions and informal communications with peers. However, this informal space has been given insufficient and unsystematic attention in China's educational research. I believe that teacher education programs should develop more comprehensive foresight of the landscape that teachers face once they enter the profession, support pre-service teachers in becoming familiar with public schools' features such as shared offices, and prepare them for taking full advantage of the connections with colleagues created by a shared office.

Implications for Future Research on Teacher Collaboration

My research demonstrates the effectiveness of applying narrative inquiry to explore teacher collaboration. The stories presented in this research respect and protect the narrative authority of teachers (Olson, 1995), here in their collective actions through also making connections to their personal histories, goals and collaborative activities. Detailed discussion of diverse teacher stories contributes to revealing the tensions between the individual and the collective in teacher collaboration. Future research on teacher collaboration can also adopt narrative-based approaches and examine whether collective stories exist in other types of school education practice (such as during different periods of compulsory education or teacher collaboration across different subject areas). This research also calls for further attention to teacher collaboration in informal forms, such as how communication among teachers in a shared office can play an important role in teachers' practical knowledge landscapes and in advancing curricular conversations that can ultimately also benefit the

students that teachers teach.

References

Ahmed Hersi, A., Horan, D. A., & Lewis, M. A. (2016). Redefining "community" through collaboration and co-teaching: a case study of an esol specialist, a literacy specialist, and a fifth-grade teacher. *Teachers and Teaching: Theory and Practice*, *22*(8), 927–946.

Andrews, M. (2004). Counter-narratives and the power to oppose. In Bamberg, M., & Andrews, M. (Eds.). *Considering counter-narratives: Narrating, resisting, making sense* (pp. 1-6). John Benjamins Publishing.

Bamberg, M. (2004). Considering counter narratives. In Bamberg, M., & Andrews, M. (Eds.). *Considering counter-narratives: Narrating, resisting, making sense* (pp. 351-371). John Benjamins Publishing.

Bamberg, M., & Georgakopoulou, A. (2008). Small stories as a new perspective in narrative and identity analysis. *Text & Talk*, *28*(3), 377–396. https://doi.org/10.1515/TEXT.2008.018

Bao, C. (2006). Policies for compulsory education disparity between urban and rural areas in China. *Frontiers of Education in China*, *1*(1), 40-55.

Bovbjerg, K. M. (2006). Teams and collegiality in educational culture. *European Educational Research Journal*, *5*(3-4), 244–253. https://doi-org.proxy3.library.mcgill.ca/10.2304/eerj.2006.5.3.244

Bu, J. (2010). Woguo zhongxiaoxue jiaoshi kaizhan jiaoxueyanjiu de lishiyanbian [A Study of the Evolution of Teaching Research by School Teachers in China, Unpublished master's thesis]. East China Normal University.

Carpenter, D. (2015). School culture and leadership of professional learning communities. *International Journal of Educational Management*, *29*(5), 682–694.

Chen, G. (2006). A commentary on the Teaching Research Group phenomenon in China. *Nantong University Journal*, *22*(4), 1–4. (In Chinese.)

Chen, J. (2005). Gongkaike de shida tongbing [Ten problems of the open class]. *Basic Education Reference*, *11*, 76-84. (In Chinese.)

Chen, L. (2020). A historical review of professional learning communities in china (1949-2019): some implications for collaborative teacher professional development. *Asia Pacific*

Journal of Education, *40*(3), 373–385. https://doi-org.proxy3.library.mcgill.ca/10.1080/02188791.2020.1717439

Clandinin, D. J. (2016). *Engaging in narrative inquiry*. Routledge.

Clandinin, D. J., & Connelly, F. M. (2000). *Narrative inquiry : experience and story in qualitative research* (Ser. The jossey-bass education series). Jossey-Bass.

Clandinin, D. J., & F. M. Connelly. (1991). Narrative and story in practice and research. In Schön Donald A. (Ed), *The reflective turn: Case studies of reflective practice*, (pp. 258–281). Teachers College Press.

Clandinin, D. J., & Connelly, F. M. (1994). Personal experience methods. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 413–427). Sage Publications, Inc.

Clandinin, D. J., & Connelly, F. M. (1995). *Teachers' professional knowledge landscapes*. Teachers College Press.

Clandinin, D. J., & Connelly, F. M. (1996). Teachers' professional knowledge landscapes: teacher stories--stories of teachers--school stories--stories of schools. *Educational Researcher*, *25*(3), 24–30.

Clandinin, D. J., Downer, C. A., & Huber, J. (2009). Attending to changing landscapes : shaping the interwoven identities of teachers and teacher educators. *Asia-Pacific Journal of Teacher Education*, *37*(2), 141–154.

Clandinin, D. J., Pushor, D., & Orr, A. M. (2007). Navigating Sites for Narrative Inquiry. *Journal of Teacher Education*, *58*(1), 21–35. https://doi.org/10.1177/0022487106296218

Clandinin, D. J., & Rosiek, J. (2007). Mapping a landscape of narrative inquiry: borderland spaces and tensions. In Clandinin, D. J. (Ed.), *Handbook of Narrative Inquiry: Mapping a Methodology* (pp. 35-76). SAGE Publications. https://dx.doi.org/10.4135/9781452226552.n2

Cochran-Smith, M., & Lytle, S. L. (1993). *Inside/outside : teacher research and knowledge* (Ser. Language and literacy series). Teachers College Press.

Cochran-Smith, M., & Lytle, S. L. (1999). Chapter 8: Relationships of knowledge and practice: Teacher learning in communities. *Review of research in education*, *24*(1), 249-305.

Cochran-Smith, M., & Lytle, S. L. (2009). Teacher research as stance. In Noffke, S. E., & Somekh, B. (Eds.), *The Sage Handbook of Educational Action Research* (pp.39-49). Sage Publications.

Connelly, F. M., & Clandinin, D. J. (1988). *Teachers as curriculum planners : narratives of experience*. OISE Press, Ontario Institute for Studies in Education.

Connelly, F. M., & Clandinin, D. J. (1990). Stories of experience and narrative inquiry. *Educational researcher*, *19*(5), 2-14.

Connelly, F.M., & Clandinin, D.J. (2006). Narrative inquiry. In Green, J. L., Camilli, G., Elmore, P. B., Camilli, G., Elmore, P. B., & Elmore, P. B. (Eds.), *Handbook of Complementary Methods in Education Research* (3rd edition) (pp.477-487). Taylor & Francis Group.

Connelly, F. M., Clandinin, D. J., & He, M. F. (1997). Teachers' personal practical knowledge on the professional knowledge landscape. *Teaching and teacher education*, *13*(7), 665-674. https://doi.org/10.1016/S0742-051X(97)00014-0

Cook, L., & Friend, M. (1991). Principles for the practice of collaboration in schools. *Preventing School Failure: Alternative Education for Children and Youth*, *35*(4), 6-9.

Craig, C. J. (1995). Knowledge communities: a way of making sense of how beginning teachers come to know in their professional knowledge contexts. *Curriculum Inquiry*, *25*(2), 151–175.

Craig, C. J. (1999). Parallel stories: a way of contextualizing teacher knowledge. *Teaching and Teacher Education*, *15*(4), 397–411. https://doi.org/10.1016/S0742-051X(98)00062-6

Craig, C. J. (2000). Stories of schools/teacher stories: a two-part invention on the walls theme. *Curriculum Inquiry*, *30*(1), 11–41. https://doi.org/10.1111/0362-6784.00152

Craig, C. J. (2002). A meta-level analysis of the conduit in lives lived and stories told. *Teachers and Teaching*, *8*(2), 197–221. https://doi.org/10.1080/13540600220127377

Craig, C. J., & Olson, M R. (2002). The development of teachers' narrative authority in knowledge communities: A narrative approach to teacher learning. In Lyons, N., & LaBoskey, V. K. (Eds.), *Narrative inquiry in practice: Advancing the knowledge of Teaching* (pp. 115–129). Teachers College Press.

Crites, S. (1971). The narrative quality of experience. *Journal of the American Academy of Religion*, *39*(3), 291–311.

Crites, S. (1979). The aesthetics of self-deception. *Soundings*, 107-129.

David, J. L. (2009). What research says about... - collaborative inquiry. *Educational Leadership*, *66*(4), 87.

Darling-Hammond, L., Richardson, N. (2009). Teacher learning: What matters. *Educational Leadership, 66*(5), 46–53.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2018). *The sage handbook of qualitative research* (Fifth). SAGE.

De Jong, L., Meirink, J., & Admiraal, W. (2019). School-based teacher collaboration: different learning opportunities across various contexts. *Teaching and Teacher Education, 86*. https://doi.org/10.1016/j.tate.2019.102925

De Jong, L., Meirink, J., & Admiraal, W. (2022). School-based collaboration as a learning context for teachers: a systematic review. *International Journal of Educational Research, 112*. https://doi.org/10.1016/j.ijer.2022.101927

Doğan Selcuk, & Adams, A. (2018). Effect of professional learning communities on teachers and students: reporting updated results and raising questions about research design. *School Effectiveness and School Improvement*, *29*(4), 634–659. https://doi.org/10.1080/09243453.2018.1500921

Downey, C. A. (2015). "they kicked him out": teachers' student stories as counterstories. *Anthropology & Education Quarterly*, *46*(1), 1–18. https://doi.org/10.1111/aeq.12084

DuFour, R. (2004). What is a "professional learning communit"? *Educational Leadership*, *61*, 6–11.

Egodawatte, G., McDougall, D., & Stoilescu, D. (2011). The effects of teacher collaboration in grade 9 applied mathematics. *Educational Research for Policy and Practice*, *10*(3), 189–209. https://doi-org.proxy3.library.mcgill.ca/10.1007/s10671-011-9104-y

Elbaz-Luwisch, F. (2001). Personal story as passport: storytelling in border pedagogy. *Teaching Education*, *12*(1), 81–101. https://doi-org.proxy3.library.mcgill.ca/10.1080/10476210124990

Elbaz-Luwisch, F. (Ed.) (2006). *Teachers' voices: Storytelling and possibility.* IAP.

Eshchar-Netz, L., Vedder-Weiss, D., & Lefstein, A. (2022). Status and inquiry in teacher communities. *Teaching and Teacher Education, 109*. https://doi-org.proxy3.library.mcgill.ca/10.1016/j.tate.2021.103524

Fan, X. Z. (2014). Chengzhenhua beijing xia xianyu yiwujiaoyu fazhan wenti yu celue – jiyu sigesheng (zizhiqu) bufen xianshi de diaoyan [Problems and Countermeasures of Compulsory Education in County Territory under the Background of Civilization – Based

on the Investigation in Some Counties and Cities of 4 Provinces]. *Journal of Huazhong Normal University (Humanities and Social Sciences)*(04), 139-146. (In Chinese.)

Friend, M., & Barron, T. (2015). School to School Collaboration. In *International Encyclopedia of the Social & Behavioral Sciences: Second Edition* (pp. 112–118). Scopus. https://doi.org/10.1016/B978-0-08-097086-8.92129-9

Friend, M., & Cook, L. (1990). Collaboration as a predictor for success in school reform. *Journal of Educational and Psychological Consultation*, *1*(1), 69–86. https://doi-org.proxy3.library.mcgill.ca/10.1207/s1532768xjepc0101_4

Gill, P. B. (2001). Narrative inquiry: designing the processes, pathways and patterns of changea. *Systems Research and Behavioral Science*, *18*(4), 335–344. https://doi.org/10.1002/sres.428

Goodlad, J. (1984). *A place called school: Prospects for the future.* McGraw-Hill.

Greene, M. (2004). Curriculum and consciousness. In D. J. Flinders, & S. J. Thornton (Eds.), *The Curriculum Studies Reader E2* (pp. 135-147). Routledge Falmer.

Grosemans, I., Boon, A., Verclairen, C., Dochy, F., & Kyndt, E. (2015). Informal learning of primary school teachers: considering the role of teaching experience and school culture. *Teaching and Teacher Education*, *47*, 151–161. https://doi.org/10.1016/j.tate.2014.12.011

Guo, H. (2003). Gongkaike: richang jiaoxue de lixianghua ji hefahua [The open class: the idealization and legalization of daily teaching]. *Educational Science Research*(06), 13-15. (In Chinese.)

Guo, L. (2012). New Curriculum Reform in China and Its Impact on Teachers. *Education Canadian and International Education / Education canadienne et internationale*, *41*, 2: 87–105. https://doi.org/10.5206/cie-eci.v41i2.9205

Hall, V., & Wallace, M. (1993). Collaboration as a subversive activity: a professional response to externally imposed competition between schools? *School Organisation*, *11*(3), 101–17. https://doi.org/10.1080/0260136930130201

Hamilton, L. S., National Center for Education Evaluation and Regional Assistance (U.S.), & What Works Clearinghouse (Institute of Education Sciences). (2009). *Using student achievement data to support instructional decision making* (Ser. Ies practice guide). U.S. Dept. of Education, National Center for Education Evaluation and Regional Assistance,

Institute of Education Sciences. Retrieved from https://ies.ed.gov/ncee/wwc/practiceguide/12

Hao, D. X. (2015). Jiyu jiaoyu xushi lijie de zhongxiaoxue jiaoshi zhuanye hezuo de xianshi kunjing jiexi [The realistic dilemma analysis of professional collaboration of primary and secondary school teachers based on educational narrative understanding]. *Journal of Curriculum and Instruction(07)*,17-19+26. (In Chinese.)

Hargreaves, A. (1994). *Changing teachers, changing times : teachers' work and culture in the postmodern age* (Ser. Teacher development). Cassell.

Hargreaves, A. (2003). *Teaching in the knowledge society : education in the age of insecurity*. Teachers College Press.

Hargreaves, A. & O'Connor, M. T. (2017). Cultures of professional collaboration: their origins and opponents. *Journal of Professional Capital and Community*, *2*(2), 74–85. https://doi.org/10.1108/JPCC-02-2017-0004

Hargreaves, A., & Fullan, M. (2012). *Professional capital : transforming teaching in every school*. Routledge.

Hargreaves, A. (2019). Teacher collaboration: 30 years of research on its nature, forms, limitations and effects. *Teachers and Teaching*, *25*(5), 603–621. https://doi.org/10.1080/13540602.2019.1639499

Hofman, R. H., & Dijkstra, B. J. (2010). Effective teacher professionalization in networks? *Teaching and Teacher Education*, *26*(4), 1031–1040. https://doi.org/10.1016/j.tate.2009.10.046

Hord, S. M. (1997). *Professional learning communities: Communities of continuous inquiry and improvement.* Southwest Educational Development Laboratory. Retrieved July, 2022, from https://sedl.org/pubs/change34/5.html

Hord, S. M., & Southwest Educational Development Laboratory. (2004). *Learning together, leading together : changing schools through professional learning communities* (Ser. Critical issues in educational leadership series). Teachers College Press.

Horn, I. S. (2010). Teaching replays, teaching rehearsals, and re-visions of practice: learning from colleagues in a mathematics teacher community. *Teachers College Record*, *112*(1), 225–259.

Horn, I. S., Garner, B., Kane, B. D., & Brasel, J. (2017). A taxonomy of instructional learning opportunities in teachers' workgroup conversations. *Journal of Teacher Education*, *68*(1), 41–54.

Horn, I. S., & Little, J. W. (2010). Attending to Problems of Practice: Routines and Resources for Professional Learning in Teachers' Workplace Interactions. A*merican Educational Research Journal*, *47*(1), 181–217. https://doi.org/10.3102/0002831209345158

Hu, Y. (2021). Historical Perspectives on the Teaching Research System and Teacher Learning since the Founding of New China. *Chinese Education and Society 53*(5-6):274-299. https://doi.org/10.1080/10611932.2021.1876421

Huang, X., & Wang, C. (2021). Factors affecting teachers' informal workplace learning: the effects of school climate and psychological capital. *Teaching and Teacher Education*, *103*. https://doi.org/10.1016/j.tate.2021.103363

Jang, J., Yoo, H., & Rubadeau, K. (2022). How teacher collaboration profiles connect to literacy instructional practices: evidence from pisa 2018 outcomes for korea. *International Journal of Educational Research*, *114*. https://doi.org/10.1016/j.ijer.2022.102010

Jenny, A. M. (2013). Narrative research: an alternative approach to study language teaching and learning. *Folios*, *37*(37), 135–147.

Johnson, B. (2003). Teacher collaboration : good for some, not so good for others. *Educational Studies*, *29*(4), 337–350.

Johnston, M. (1990). Experience and reflections on collaborative research. *International Journal of Qualitative Studies in Education*, *3*(2), 173–183. https://doi-org.proxy3.library.mcgill.ca/10.1080/0951839900030205

Johnston, W., & Tiffany, B. (2018). *The Prevalence of Collaboration Among American Teachers: National Findings from the American Teacher Panel.* RAND Corporation. https://doi.org/10.7249/RR2217

Kyndt, E., Gijbels, D., Grosemans, I., & Donche, V. (2016). Teachers' everyday professional development: mapping informal learning activities, antecedents, and learning outcomes. *Review of Educational Research*, *86*(4), 1111–1150. https://doi-org.proxy3.library.mcgill.ca/10.3102/0034654315627864

Lave, J., & Wenger, E. (1991). *Situated learning : legitimate peripheral participation* (Ser. Learning in doing: social, cognitive, and computational perspectives). Cambridge University Press.

Lee, J. C.-kin, Zhang, Z., & Yin, H. (2011). A multilevel analysis of the impact of a professional learning community, faculty trust in colleagues and collective efficacy on teacher commitment to students. *Teaching and Teacher Education*, *27*(5), 820–830. https://doi.org/10.1016/j.tate.2011.01.006

Lefstein, A., Segal, A., Becher, A., & Louie, N. (2020). Taking stock of research on teacher collaborative discourse: theory and method in a nascent field. *Teaching and Teacher Education*, *88*. https://doi.org/10.1016/j.tate.2019.102954

Leko, M. M., Kiely, M. T., Brownell, M. T., Osipova, A., Dingle, M. P., & Mundy, C. A. (2015). Understanding special educators' learning opportunities in collaborative groups: the role of discourse. *Teacher Education and Special Education*, *38*(2), 138–157. https://doi.org/10.1177/0888406414557283

Levine, T. H., & Marcus, A. S. (2010). How the structure and focus of teachers' collaborative activities facilitate and constrain teacher learning. *Teaching and Teacher Education*, *26*(3), 389–398. https://doi-org.proxy3.library.mcgill.ca/10.1016/j.tate.2009.03.001

Li, S. (2014). Sixty years of China's primary and secondary school teaching research: Reflection and prospect. *Contemporary Education Sciences*, *29*(17):15-19. (In Chinese.)

Li, A. (2019). Zhong xiaoxue keti yanjiuzhongde jiben zhunze [Basic principles of educational research projects in primary and secondary schools]. *Teaching & Administration*(34), 32-34. (In Chinese.)

Little, J. W. (1990). The Persistence of Privacy: Autonomy and Initiative in Teachers' Professional Relations. *Teachers College Record*, *91*(4), 509-536. https://doi.org/10.1177/016146819009100403

Little, J. W. (2002). Locating learning in teachers' communities of practice: opening up problems of analysis in records of everyday work. *Teaching and Teacher Education*, *18*(8), 917–946. https://doi-org.proxy3.library.mcgill.ca/10.1016/S0742-051X(02)00052-5

Little, J. W. (2003). Inside teacher community: representations of classroom practice. *Teachers College Record*, *105*(6), 913–45. https://doi-org.proxy3.library.mcgill.ca/10.1111/1467-9620.00273

Liu, Y. (2013). The social organisation of talk-in-interaction at work in a language teacher professional community. *Learning, Culture and Social Interaction*, *2*(3), 195–207. https://doi.org/10.1016/j.lcsi.2013.06.001

Liu, P., Liu, L., & Xie, Y. (2018). Leadership of class teachers (banzhuren) in improving student learning: case studies of Chinese primary schools. *Frontiers of Education in China*, *13*(1), 28–55. https://doi.org/10.1007/s11516-018-0002-4

Liu, P., & Xiu, Q. (2019). Teacher Professional Collaboration in China: Practices and Issues. *Beijing International Review of Education*, *1*(1), 162-178. https://doi.org/10.1163/25902547-00101012

Liuzhou Education Bureau. (2022). *Notice on carrying out the evaluation of professional titles of primary and secondary school teachers in Liuzhou in 2022*.

Lomos, C., Hofman, R. H., & Bosker, R. J. (2011). Professional communities and student achievement - a meta-analysis. *School Effectiveness and School Improvement*, *22*(2), 121–148.

Lortie, D. C. (1975). *Schoolteacher : a sociological study*. University of Chicago Press.

Louis, K.S., Kruse, S., & Marks, H. (1996). Schoolwide professional community. In Fred Newman and Associates (Ed.), *Authentic achievement: Restructuring schools for intellectual quality* (pp.179-203). San Francisco: Jossey-Bass.

Lu, X., & Wang, J. (2009). Jiaoyu xingdong yanjiu de lishifazhan yu zhongguohua lichen [The History Development and the Localization Process of Educational Action Research]. *Contemporary Education and Culture*(06), 43-49. (In Chinese).

Lytle, S. L., & Fecho, R. (1991). Meeting strangers in familiar places: teacher collaboration by cross-visitation. *English Education*, *23*(1), 5–28.

MacIntyre, A. C. (2007). *After virtue : a study in moral theory* (3rd ed.). University of Notre Dame Press.

Maeroff, G. I. (1988). *The empowerment of teachers : overcoming the crisis of confidence*. Teachers College Press.

Maines, D. R. (1993). Narrative's moment and sociology's phenomena: toward a narrative sociology. *Sociological Quarterly*, *34*(1), 17–17. https://doi-org.proxy3.library.mcgill.ca/10.1111/j.1533-8525.1993.tb00128.x

Meirink, J. A., Meijer, P. C., & Verloop, N. (2007). A closer look at teachers' individual learning in collaborative settings. *Teachers and Teaching*, *13*(2), 145–164. https://doi.org/10.1080/13540600601152496

Wang, D. (2011). The new curriculum and the urban-rural literacy gap. *Chinese Education and Society*, *44*(6), 87–101.

Webster, L., & Mertova, P. (2007). *Using narrative inquiry as a research method: An introduction to using critical event narrative analysis in research on learning and teaching*. Routledge.

MetLife Foundation. (2009). *The MetLife survey of the American teacher: Collaborating for student success*. Retrieved from http://files.eric.ed.gov.proxy3.library.mcgill.ca/fulltext/ED509650.pdf

Ministry of Education of the People's Republic of China. (2006). *Jiaoyubu guanyu jinyibu jiaqiang zhongxiaoxue banzhuren gongzuo de yijian* [Opinions of the Ministry of Education on Further Strengthening the Work of Class Teachers in Primary and Secondary Schools]. (In Chinese.) http://www.moe.gov.cn/srcsite/A06/s3325/200606/t20060604_81917.html

National Institute of Education Sciences. (2012). Jichujiaoyu kechenggaige shinian: jingyan, wenti yu duice [Ten Years of Basic Education Curriculum Reform: Experience, problems and countermeasures]. *Educational Science Research(09),* 5-12+17. (In Chinese.)

Norris, N. (2014). *Curriculum and the teacher : 35 years of the cambridge journal of education* (Ser. Education heritage). Taylor and Francis.

Odette Wright, K. (2017). Narrative analysis/inquiry. *The International Encyclopedia of Communication Research Methods,* 1-9.

Olson, M. R. (1995). Conceptualizing narrative authority: implications for teacher education. *Teaching and Teacher Education*, *11*(2), 119–35. https://doi.org/10.1016/0742-051X(94)00022-X

Olson, M. R., & Craig, C. J. (2005). Uncovering cover stories: tensions and entailments in the development of teacher knowledge. *Curriculum Inquiry*, *35*(2), 161–182. https://doi.org/10.1111/j.1467-873X.2005.00323.x

Paine, L., & Ma, L. (1993). Teachers working together: A dialogue on organizational and cultural perspectives of Chinese teachers. *International Journal of Educational Research, 19*(8), 675–697. https://doi.org/10.1016/0883-0355(93)90009-9

Patton, K., & Parker, M. (2017). Teacher education communities of practice: more than a culture of collaboration. *Teaching and Teacher Education*, *67*, 351–360. https://doi-org.proxy3.library.mcgill.ca/10.1016/j.tate.2017.06.013

Polkinghorne, D. (1988). *Narrative knowing and the human sciences*. State University of New York Press.

Polkinghorne, D. E. (1995). Narrative configuration in qualitative analysis. *International Journal of Qualitative Studies in Education*, *8*(1), 5–23. https://doi.org/10.1080/0951839950080103

Polkinghorne D. E. (1997). Reporting qualitative research as practice. In Tierney W. G., & Lincoln Y. S. (Eds.), *Representation and the text: re-framing the narrative voice* (pp. 3–21). State University of New York Press.

Qiao, X., Yu, S., & Zhang, L. (2018). A review of research on professional learning communities in mainland China (2006-2015): key findings and emerging themes. *Educational Management Administration & Leadership*, *46*(5), 713–728.

Reeves, P. M., Pun, W. H., & Chung, K. S. (2017). Influence of teacher collaboration on job satisfaction and student achievement. *Teaching and Teacher Education*, *67*, 227–236. https://doi.org/10.1016/j.tate.2017.06.016

Ronfeldt, M., Farmer, S. O., McQueen, K., & Grissom, J. A. (2015). Teacher collaboration in instructional teams and student achievement. *American Educational Research Journal*, *52*(3), 475–514.

Rytivaara, A., Pulkkinen, J., & de Bruin, C. L. (2019). Committing, engaging and negotiating: teachers' stories about creating shared spaces for co-teaching. *Teaching and Teacher Education*, *83*, 225–235. https://doi.org/10.1016/j.tate.2019.04.013

Sanjiang County Statistics Bureau. (2021). *Main Data Bulletin of the Seventh National Census of Sanjiang County*.

Schmoker, M. (2005). No Turning Back: The Ironclad Case for Professional Learning Communities. In DuFour, R., Eaker, R. E., & DuFour, R. B. (Eds.), *On common ground: The power of professional learning communities* (pp.135-154). Bloomington, Ind: National Educational Service.

Scribner, J. P., Sawyer, R. K., Watson, S. T., & Myers, V. L. (2007). Teacher teams and distributed leadership: a study of group discourse and collaboration. *Educational Administration Quarterly*, *43*(1), 67–100.

Shan, Z. (2014). Towards the Reform of Teaching and Research Group of Professional Learning Communities with Chinese Characteristics. *Educational Research (10)*, 86-90. (In Chinsese).

Sleegers, P., van den Berg, R., & Geijsel, F. (2000). Building innovative schools: the need for new approaches. *Teaching and Teacher Education*, *16*(7), 801–808. https://doi.org/10.1016/S0742-051X(00)00026-3

Strahan, D. (2003). Promoting a collaborative professional culture in three elementary schools that have beaten the odds. *The Elementary School Journal*, *104*(2), 127–146. https://doi.org/10.1086/499746

Stoll, L., Bolam, R., McMahon, A., Wallace, M., & Thomas, S. (2006). Professional learning communities: a review of the literature. *Journal of Educational Change*, *7*(4), 221–258. https://doi.org/10.1007/s10833-006-0001-8

Vangrieken, K., Dochy, F., Raes, E., & Kyndt, E. (2015). Teacher collaboration: a systematic review. *Educational Research Review*, *15*, 17–40. https://doi.org/10.1016/j.edurev.2015.04.002

Vescio, V., Ross, D., & Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. *Teaching and Teacher Education*, *24*(1), 80–91. https://doi-org.proxy3.library.mcgill.ca/10.1016/j.tate.2007.01.004

Wang, D., Wang, J., Li, H., & Li, L. (2017). School context and instructional capacity: a comparative study of professional learning communities in rural and urban schools in China. *International Journal of Educational Development*, *52*, 1–9. https://doi.org/10.1016/j.ijedudev.2016.10.009

Wang, J. J., & Chen, L, C. (2020). Zhong xiaoxue jiaoshi jiti jiaoyan: “kongxinhua” xianxiang yu “shixinhua” huigui [The Phenomenon of “Hollowing”and “Solidifying” of Collective Teaching and Research of Primary and Secondary School Teachers]. *Journal of Educational Science of Hunan Normal Univeersity(02)*, 43-49. (In Chinese.)

Wenger, E. (1999). *Communities of practice : learning, meaning, and identity* (First paperback, Ser. Learning in doing). Cambridge University Press.

Wu, H., & Clarke, A. (2018). The Chinese "open class": a conceptual rendering and historical account. *Asia Pacific Journal of Education*, *38*(2), 214–228. https://doi-org.proxy3.library.mcgill.ca/10.1080/02188791.2018.1460260

Xu, Q. (2021). Mubiao tidai, guanxi quge yu jiaoshi zhicheng pingding [Goal substitution, habitual division and the involution of teacher's professional title evaluation]. *Social Sciences of Beijing* (04), 116-128. (In Chinese.)

Xu, S., & Connelly, F. M. (2009). Narrative inquiry for teacher education and development: focus on english as a foreign language in China. *Teaching and Teacher Education*, *25*(2), 219–227. https://doi.org/10.1016/j.tate.2008.10.006

Yuan, R., & Zhang, J. (2016). Promoting teacher collaboration through joint lesson planning: challenges and coping strategies. *The Asia-Pacific Education Researcher*, *25*(5-6), 817–826. https://doi.org/10.1007/s40299-016-0300-7

Zeng, Y., Yang F. & Lv, J. (2017). A comparative study of teacher collaboration in Shanghai and England in Educational Reforms. *Teacher Development Research (03)*, 28-35. (In Chinese.)

Zhang, J., & Pang, N. S.-K. (2016). Exploring the characteristics of professional learning communities in china: a mixed-method study. *The Asia-Pacific Education Researcher*, *25*(1), 11–21. https://doi-org.proxy3.library.mcgill.ca/10.1007/s40299-015-0228-3

Zhang, J., & Sun, Y. (2018). Development of a conceptual model for understanding professional learning communities in China: a mixed-method study. *Asia Pacific Education Review*, *19*(4), 445–457. https://doi.org/10.1007/s12564-018-9548-3

Zhang, X., & Wong, J. L. N. (2018). How do teachers learn together? a study of school-based teacher learning in China from the perspective of organisational learning. *Teachers and Teaching*, *24*(2), 119–134. https://doi-org.proxy3.library.mcgill.ca/10.1080/13540602.2017.1388227

Zhang, J., & Zheng, X. (2020). The influence of schools' organizational environment on teacher collaborative learning: A survey of Shanghai teachers. *Chinese Education & Society*, *53*(5-6), 300-317. https://doi-org.proxy3.library.mcgill.ca/10.1080/10611932.2021.1879553

Zhong, Q. (2005). Zhongguo kecheng gaige: tiaozhan yu fansi [Curriculum Reform in China: Challenge & Reflection]. *Comparative Education Review(12)*, 18-23. (In Chinese.)

Zhou, S. (2021). The role of China's teaching research system in promoting evidence-based reform in education: A case study of Jiangsu province. *Best Evidence in Chinese Education, 9*(2): 1227-1241. https://doi.org/10.15354.bece.21.or067

Zhu, X., & Qin, J. (2008). Gongkaike yu jiaoshi zhuanye fazhan guanxi de diaochayanjiu [An Investigation on the Relationship between Open Class and Teachers' Professional Development]. *Curriculum, Teaching Material and Method(05),* 83-88. (In Chinese.)

Appendix A. Interview Guide

Interview 1

1) How long have you been a teacher?

2) What was your subject in college/university?

3) Were there any important people/events that made you decide to come to this school?

4) Please recall a time when you collaborate with others as a teacher for the purpose of planning for teaching, whether at your current school or not.

5) Did you help other teachers during that collaboration?

6) Did the teacher collaboration solve your specific teaching problems? If so, in what ways?

7) Is teacher collaboration indispensable to your professional development?

8) What are your expectations for the latest upcoming collaboration?

9) What problems do you think this collaborative activity can support you to solve?

10) Could you please describe in one word/term how you feel about your collaboration with other teachers? Why?

Interview 2

1) What motivated you to join the teacher research project?

2) Can you recall an impressive event that you experienced during the project?

3) What did you care most during the project?

4) How has participating in this project affected you?

5) Did you encounter any challenges/difficulties in the project?

6) Is there anything that you feel disappointed about this project? If so, would you

recommend improvements to make your collaboration experiences a better process?

7) Do you think the project you participated in meet the theme you used in your last interview? Do you want to modify it, why or why not?