At the Crossroad of Technology Integration:

How collaborative teaching preparation facilitates Chinese language educators to develop

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Abstract

COVID-19 pandemic has profound global impact not only as a health crisis, but also as a time period that gave birth to radical social changes. Following the suggested measure of social distancing, responses of US educational system—shifting the mode of instruction to online only—present the significance of technology towards the contemporary society and education specifically. Language education, as a field in education that relies heavily on communication, were undergoing critical challenges out of the online shift. University language instructors, working for their specific language programs, are expected to navigate themselves through the challenge of cooperating with technology integration and ultimately equip themselves with professional knowledge and competence digitally. This study focuses on a group of university Chinese language course instructors to investigate how they collaborate as a team facing to the challenge of technology integration, and how they develop themselves as technologically competent language educators along this journey. Analysis has been conducted about both what the instructional team decided to accomplish teaching for the online school year and what individual instructors developed professionally as language educators. Findings indicated that instructors formed teaching preparation group which helped them to collaboratively learn about technology integration and apply their developed competence while teaching. They as a team identified a customized course design originated from flipped classroom approach, and developed their accommodated activities of pre-learning and post-learning in addition to their modified lectures and discussion sections. Through their on-going course preparation, teachers developed their profession about technology in terms of knowledge and belief. They also saw potential of technology integration being beneficial regardless of major modality of instruction, and would preserve some of their measures during this school year to the future.

1 Problem Statement

1.1 Necessitating Technology in Education: The challenge of COVID-19

We as individuals in the information era are socialized and culturalized by technology, and most of the time, take that without thinking twice. Technology penetrating into our daily life is no longer a news, and our dependence on technology is not our autonomous choice any more. It not only became the carrier of all the information and interaction that individuals need, but also formed a sense of togetherness and connectedness for communities (E. Wenger et al., 2005). This has been intensively testified and critically reflected after the COVID-19 outbreak. 'The virtual' has become our immediate and go-to choice when social distancing had to be put in place, and it had to be the panacea simply because we had no other choice. In educational context, the dependence of teaching and learning on technology have been inevitably elevated during this period of time. Most of the schools were run through online platforms, meaning educational practices were in need of amendment. Like it or not, this period of time challenges all education practitioners to not only accommodate the shift, but hopefully leverage it to their advantage as well.

The digital mode of teaching and learning is not an unfamiliar topic for education. School and institutions have been offering online and hybrid courses for quite a while, but this used to be optional for students, not a formed norm. Pandemic situation has necessitated, and served as a magic accelerator of this online movement. Despite of the on-going challenges about online education in terms of accessibility, affordability, and effectiveness, classrooms going technology-based has been widely chosen by most US institutions since March, 2020 (Crawford et al., 2020). It is predicted that its impact, just like the other impacts of COVID, will be carried on to post-COVID era, in a non-linear, messy manner (Tesar, 2020).

People of all roles in education has been pushed to make rapid and smooth transition towards intensive technology integration--not in a gentle manner, but a demanding and comprehensive one. Resource distribution, staff readiness and confidence, student accessibility and motivation all play important function in this period of time (Ali, 2020). For teachers who have not yet been familiar enough with technology-integrated teaching and learning, transitioning all they were traditionally familiar with to an online form is not an easy task. It has been reported by a lot of teachers and faculty members that technology integration is the major effort to make during this special time of their teaching career. (Bao, 2020; Shenoy et al., 2020; Toquero, 2020). These changes are not merely about the physical distancing and platform shift. It also means that all the physical materials have to be distributed through online platform; the ways in which teachers plan, teach, connect with students should all be reconsidered; and the ways teachers interact with each other can no longer stay the same.

1.2 Hosting Language Lesson Virtually: remote teaching as a new norm

The change to technology-intensive teaching during COVID-19 differed from previous technology-integration for most of the teachers, as the one and only approach that everything could be done was through online. As a subject that naturally relies on imitating others' speech, person-to-person interaction and socializing among speakers, language education was facing unique challenges. Recent research that explore the emergency virtual language teaching indicates that platform choice, curriculum adjustments, activity design, medias use, student engagement, assessment, and the sociocultural meaningfuoness are all in need of critical consideration (A. Ahmadi & Ilmiani, 2020, 2020; Cheung, 2021; J. Egbert, 2020; Gao J. & Li, 2021). In terms of Chinese language teaching in specific, general challenges and Chinese

language specialty challenges are all present. Generally speaking, the design of the online teaching curriculum and the materials used to facilitate learning in a technology-based environment are in urgent need to be re-planned (C. Chen, 2021; Wang & East, 2020). During the re-planning and teaching preparation, the interaction among teacher and students is one of the major concerns, which is specifically important for language teaching and learning, where being able to communicate serves as the ultimate goal. Online platform limits the modality of class communication, in-group activities and the teachers' capability monitoring and providing feedbacks in class, which proposes changes of class size, wise use of the class meeting platform, and redesign of class materials(Yang & Lin, 2020). Some hands-on strategies provided include: the construction of active community starting from pre-semester outreach, recording and revisiting possibilities for review and extensive learning, innovative synchronous and asynchronous activities, as well as caring and mindfulness of students' wellbeing (Qu, 2021). One challenge that stands out as a Chinese-specific factor in online teaching is the character handwriting, which, due to the limitation of digital meeting platforms and accessibility to hand-input devices, requires extra efforts to be accommodated into online teaching (Qu, 2021; Q. Zhang, 2020). What has gradually changed during the online teaching practice is teachers' competence teaching in the online environment, and their perspectives/belief towards online Chinese teaching. Interviews reveals teachers' effort to actively learn, thus become increasingly fluent applying digital literacy in their teaching (Gao & Zhang, 2020; Zhang, 2020). They also acknowledge potentials to apply COVID teaching strategies to post-pandemic time, and express more openness to innovative pedagogical attempts.

My dissertation research aims at digging into this messy transition period documenting the approaches of in-service Chinese language teacher facing to the radical challenge of the

technology-intensive online mode—both their classrooms and offices. What is particularly interesting is (1) to rationalize the come-together of instructor groups in order to prepare for technology-intensive language teaching, (2) to understand how instructors navigate through the challenges with their communities instead of facing those alone, and (3) to explore how they develop themselves as more technology-competent educators.

1.3 Research Question

Previous research on teacher development is frequently based on how educators' development leads to effective teaching practice and optimistic student achievements. This, as argued in Van Driel et al. (2012), rom an intervention-outcome perspective, which emphasizes the product of teacher development rather than the process. Alternatively, in my dissertation research, the focus will be located on teachers' developmental process beyond the outcome of teacher learning itself. The goal of this research was to explore the ways in which Chinese language educator group, through collaborative teaching preparation (CTP, defined later in section 2.4.1), addressed the challenges of technology integration in their teaching profession. Focus was especially put on how CTP invited this instructor group to react and take action to face the unescapable shift to online teaching as a situated teacher learning space. Inquiry was also extended about the career-long development of teacher knowledge, teacher beliefs and perspectives about technology integrated teaching while experiencing this challenging time. Hence, proposed research questions cover two aspects: 1) portrait of language instructors' collaboration to prepare for teaching online, 2) trajectories of teacher development as teacher group participants. The research questions are as follows:

RQ 1: "What's going on in the CTP space for the studied language educators?"

a) What technology-related topic are covered in CTP activities?

b) How do these educators collaboratively act on these discussed topics?

RQ 2: "How do language educators perceive their professional growth while participating in CTP?"

a) How do they perceive their learning experiences through CTP?

b) How do their perceptions about technology in language education change?

c) What are their perceived pains and gains in the CTP experience?

1.4 Positionality of the researcher

I identify myself as a Chinese educator, a language education researcher and technology enthusiastic who is interested in teachers' collaboration and professional development. During my ongoing teaching practice, I constantly implemented technology-integrated teaching method in both face-to-face classrooms and remote teaching environments. With some previous working experience in media industry, I was lucky enough to develop my competence in digital media, multimedia content production, and digital literacy, which has significantly supported my own technology integration process in my own classrooms, as well as my attempts sharing my knowledge with fellow teachers when opportunities were provided.

With a Chinese cultural background that treasures collectivism and harmony, I resonate with the need of the Chinese educators to collaborate on challenges and learn from each other especially for the educational innovations. Meanwhile, I feel the meaningfulness of teachers being technology-competent, not only because this is the trend in education, but also in order to keep up the pace of the era of information and technology. Collective teacher groups and teachers' collaborative work have been, and will continue to be my preferred approach to

guarantee effective workplace communication in response to the radical challenges, and to encourage teachers to learn from it. In particular, I am interested in exploring the context in which such collaboration would take place, including both social and institutional factors. These set the tone for teachers' working and learning efforts, and act as variables for teachers' cognitive development in relation to technology integration.

I decided to dig deep in this specific research topic upon engaging in a language instructor community for a university level language course during the COVID situation evolves. I was invited as a member of this instructional team of three to provide help on preparing multimedia teaching materials, exploring new platforms of online teaching, and troubleshooting for technical issues they came across. I witnessed their difficulties and challenges to be addressed, and engaged into their work circles to actively make online language education user-friendly for both teachers and students. I expressed my interest and expertise towards Chinese language teaching and technology integration at the beginning of our collaboration right before the start of my researched school year. I served both the role of researcher and critical friend of the teacher team throughout my research process. Not only have I observed their daily practice meeting, negotiating, and learning from the online shift from in-person language classroom, but also provided technical and pedagogical advice to the teacher group upon invitation in the teaching preparation and research process. My researched teacher group and I agree that we mutually benefit from each other by exploring techniques of technology-integrated language teaching and studying the teaching preparation process.

With remote teaching and learning being trendier on the market, I hope my research would provide an insight for educators, administrators, and educational institutions about how teachers, especially language instructors, navigate through the challenge of technology shift and carry on

their professions as responsible educators. I also hope the CTP mode of teachers from Chinese culture will provide some inspiration for teachers from all cultural backgrounds.

1.5 Significance of the study

My dissertation research senses the challenges this emergent transition from in-person to online teaching has brought to education, documenting the collaborative approaches in-service languages teacher use in response to the radical change and providing an insight on constructive teacher development overtime.

Teachers' workplace learning efforts, especially in on-going work settings, have been more of a productivity oriented, problem-solving situation (Imants & Veen, 2010). Teachers come across issues and solve them when they work with their students and identify the issues that they need to solve, and less commonly, when they do student-related work with their colleagues. Significantly impacting human's life, COVID-19 being historically unique in terms of re-shaping the norm of education, has provided more potential aspects for teacher learning, and has consequently extended the boundaries of teachers' perception how can education take place, and what can educators do as facilitators of learning in such challenging time. It has put language educators at the frontline of coming up with, and learning about the proposed alternatives for traditional language teaching materials (such as paper-based handout and workbook), in-person model of language instruction, as well as interpersonal communication mode on virtual platforms. Teachers' workplace learning in the aspects above is not merely targeting at the specific situation of global pandemic. Documenting teachers' preparation process would not only keep track of teachers' attempts responding to technology-related changes as a community, but also reflects on teachers' collaborative workplace learning experience bridging

their previous knowledge to a challenging time, and set up a model for future reference when technology becomes an inevitable element in teaching--even if language educators are not obliged to teach classes solely online.

2 Literature Review

The research topic stands at the intersection of technology, teacher cognition and develop, teacher learning, and teacher collaboration as a community. To answer the questions proposed for this research, previous scholarly work related to the following aspects inspires the theorization of language instructors' collaborative preparation for technology-integrated teaching during COVID-19:

2.1 Technology and language teaching

This section discusses technology and its' educational application in language teaching and learning. I start from exploring the definition of technology, and move towards the contextualization of it in the field of language education in contemporary society.

2.1.1 Technology defined: the ambiguity

Although being frequently discussed as an inevitable term of the society, technology has not been clearly defined yet. There are three major reasons, according to Scharff & Dusek (2014, p.241), that can address the difficulty of reaching consensus what technology refers to, and they collaboratively illustrates the features of technology.

Firstly, questions remain unsolved whether the discussion about technology should be exclusive for modern society or extensive to cover all the forms including the ones in

prescientific period. Attempts to define technology starts etymologically from studies that trace back the origin of this term. The Greek root of 'technology', "*techne*", has a meaning of art and craft (Murphie & Potts, 2017; Singh, 2016), which is understood as one of the ways of making, with *phronesis* (prudence) and *episteme* (science) being the other counterpart (Schatzberg, 2018, p.20). Although without an agreed conceptualization as a practice, philosophy or epistemology, the essence of techne, as stated in Davis (2006), is always 'to be wily and clever in the manipulation of the nature' (p.7), which indicates that technology needs to be accompanied by wisdom and contextualized to the good of others. As mostly a self-evident concept, its boundary has been broadened from "knowing how to do things" to the involvement of reasoning, then empassing various forms of knowledge, making *techne*, (or *ars,* the Latin concept of Greek *techne*) a more comprehensive concept that deal with contingent human choice of making process. Present-day term of technology, on the other hand, extends from knowledge embodied in skillful making to a much broader boundary. It has been considered as a key word under the discourse of post World War II innovation studies, social and humanistic approaches, and public awareness considering its raising social, cultural, and political power (Schatzberg, 2018). This has complicated the confusion around the meaning of technology.

Secondly, it is hard to escape from the conceptualization of technology as a form of equipment or as a strand of applied science, although it has been recognized as inclusive, and the instrumentalizing conceptualization is considered as deeply problematic. Industrial revolution breaks the practical limits of humankind, and results in radical changes to society, production, and the nature. This gives birth to the development of different branches in theorizing technology. One of the instrumental approach of understanding technology regards it as a value-neutral tool that is subject to human control (Borgmann, 2009), which can rationalizes

technology optimism, which refers to humans' attempts to get to know nature, then dominate it through what we learn. Conflicting with such perspective is the idea that rational process in which technology engages was not purely a tool, but invades the non-technical world and become the unexpected force of human life. This is regarded as technology pessimism. Both technology optimistic and pessimistic perspectives are detailed in Tiles & Oberdiek (2013) and are problematized as dehumanizing human fulfillment and neutralizing human values. Such dehumanizing potential and unintended impact on of modern technology has also been evident in the tension between instrumental and cultural approaches to understand technology (Schatzberg, 2018). Technology--under such cultural turn--is understood as the material basis of a decentralized, humanized, and environmentally sound society, and should be connected with ethical and moral considerations when furthering alternative futures.

Thirdly, none of the existing definitions is competitive enough to stand out from all the alternatives to explain the nature of technology and to specify its defining features. Scholars hence develop their situated definition based on the specific context of their projects (Schatzberg, 2018, p.216). There are many references that one could choose from when conceptualizing technology, and these are developed as characteristics of technology(de Vries, 2016). Technology has been regarded as artifacts, as knowledge, as process, as a humanistic approach, as an ethic and aesthetics, and as philosophy. In return, subjective associations of technology with individual thinking is also relevant to the history of technology, through its embodiment in technological designs and ways of application in the social world.

The fact of no perennially agreed definition best depicts what technology is—it is a complex idea that penetrates in every aspect of our thinking and doing. It not only generally refers to the everchanging elements that facilitates social revolution, but also specifically stimulates the

innovative ideology and practical tools that leads the contemporary society. With such complicity kept in mind, conceptualization of technology under the educational context is situated in unsettled definition of technology—it can be ideological or practical, as an approach or as an entity, as knowledge or as a tool. It is specifically important to consider technology as a complicated idea rather than regarding it as a flaky idea of tool or approaches to function in contemporary society. A more detailed definition has to be discussed in a more s

2.1.2 Intersecting technology with education

In the field of education, technology is contextualized and thus understood as:

> *...'the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technology processes and resources' (Januszewski & Molenda, 2013, p.1)*

Besides confirming the significance of technology as a tool and fruitful resource to be used to facilitate learning and improving performance, this definition emphasizes the social and ethical considerations attached to the technological process. This resonate with Luppicini's (2005) argument that use of technology are guided by the techniques and approaches that multiple knowledge domains needs to incorporate comes under the accompany of the sociocultural awareness of the issues to be solves and the goals to be achieved. This sets the tone of our discussion about technology integration in this research that technology is not neutral gadgets that applies to the existing system of teaching professionalism. Its educational application reshapes the macro-level conceptualization of how education approaches students creatively and innovatively, and at a micro level, constructs teachers' understandings of their theoretical position, their roles in the education process, as well as the social, cultural, and historical

contexts that contain these developments and practices (Kimmons et al., 2015; Kopcha et al., 2020).

The way in which educational technology and learning intersect is theorized as a complex, fuzzy interwovenness. Firstly, technology reshapes the knowledge construction in the digital age. Technological knowledge is understood with its unique epistemological feature, and is essentially applicable to real situations that are embedded in human activities (Herschbach, 1995).This agrees with Layton 's(1974) view of technological knowledge as a spectrum with idea as one end, and technique as another. Knowledge construction in activities composes socially constructed learning environments that emphasize the importance of collaboration, which, from a socio-constructive perspective, shed lights on the extension of traditionally-understood knowledge, the multiplicity of self-regulatory activity, the community factor of learning, and the social context that hosts the learning and thinking activities (Lowyck, 2014, p.9).

Secondly and inseparably, technology reshapes the ways in which knowledge (of all kinds) is being conveyed and communicated. Technology literacy, as defined in Estes (2017) as "the ability to effectively use technology to access, evaluate, integrate, create and communicate information to enhance the learning process through problem-solving and critical thinking"(p. 103), is an inescapable component of one's competence in both personal and professional life. Davies' (2011) three-level technology literacy framework portrays the continuum of how technology immerses in one's learning, life, and community. Technology literate individuals at the *awareness* level start to be introduced to forms of new technology, and answer the questions of what can technology do. Developing into *praxis* level, they bring technology into their practice with guidance, and explore the variety of technology applications. Moving towards *phronesis* level, they develop appropriateness to critically understand and effectively use

technology as their practical competence and wisdom. The everchanging nature and the rapid evolvement of technology in the contemporary society indicates the cyclical nature of technology literacy development, because both the technology itself and the context to which the technology applies can always be different. The development one's technology literacy is thus a lifelong endeavor that requires reflective practices and learning in order to refine the existing technological knowledge to the updated version. Education in the current digital age points at two groups of people for technology literacy development: students need to be technologically intelligent, which requires constant renovation of current curriculum and teaching materials that are present in the digital age; and to ensure that, teachers need to be technologically intelligent, which urges them to familiarize themselves with newly invented and updated technologies. This would enable them to become critical initiators and actively engage in the digital movement (Hicks & Turner, 2013; Krumsvik, 2008; Kubey, 1997).

Technology-related educational reforms, informed by the two dimensions through which technology is embedded in learning, is consist of two directions: towards a technology-adopted curriculum, and technology-intensive classroom practice. It is considered important to include core skills of digital citizenship in twenty-first century learning both in forms of formal education and in lifelong learning attempts(Grimus, 2020). An updated course design with insertion of technological knowledge ensures that students learn the content that are applicable to the digital age instead of some outdated decontextualized information that is no longer relevant to the current society. Meanwhile, technology-integrated classroom practice models the social interactions that are increasingly technology-based within and across communities, thus ensures in-time application of the learnt technological knowledge. Such technology integration, understood as effective implementation of educational technology to accomplish intended

learning outcomes (Davies & West, 2014, p.843), aids teaching by *replacing, amplifying,* and *transforming* (RAT) the educational practices that previously dominate the classrooms. This "RAT" framework presented by Hughes et al. (2006) focuses on the quality of technology implementation in classroom practice instead of quantity of technology use, which would also be helpful to interpret teachers' decision making and classroom practice when technology-integrated pedagogy comes into play.

Technology-integrated teaching is neither a catch-up of the fashion of the information era, nor a show-off of schools and teachers' capability to import new tools to amaze their students. It possesses unique meaningfulness in terms of revolutionizing students' thinking about their learning experiences, choices of career pathways, and their life-long journey as socialized individuals—all of which are in the range of teachers' critical consideration. Such meaningfulness of technology integration encourages extensive exploration about how teachers' practice of technology integration is implemented. This will be discussed intensively in the following sections.

Narrowing the focus to language education specifically, the incorporation of technology has formed its own climate with the establishment of Computer-assist Language Learning (CALL). The definition of CALL, as discovered by Kern (2006), has witnessed a broadening of relationship between technology and language education. CALL initially proposed in Levy (1997, p.1) as "the search for and study of the applications of computer in language teaching and learning", which draws the emphasis on the role of a digital tool, the computer, to conduct education. To be more specific, technology in CALL has been contextualized as digital approaches that are closely related to the use of computer, and if applicable, other digital devices (Ahmadi & Reza, 2018; Chun et al., 2016; Kern, 2006), which leads to the proposed replacement

of CALL by "TELL" (technology-enhanced language learning). In a review of studies (Shadiev & Yang, 2020), 24 forms of technologies are identified as helpful for language learning, and improve motivation and interests of learners. Other research studying CALL(and TELL) regards computer technologies not only as aids of teaching and learning, but also as contextual elements through which language education is practiced (J. L. Egbert, 2005; Garrett, 2009; Thomas et al., 2012). The learning objective of language education in digital era is facing a technological change compared with the traditionally understood language education (Chun et al., 2016). Since one of technology-related feature of language education is that technology critically shapes the way how communication and connections are made, language and literacy being taught should keep up with these changes in the digital age (Barton & Lee, 2013). Language that are circulating in the multi-dimensional world are becoming more colorful accordingly, and what we considered as authentic language and authentic materials is always renewed following the rapid change of the digitalized world. In other words, technology not only adds a virtual segment of daily communication, but also shifts the ways in which the world is represented and the manner how people communicate. Language that are circulating in the multi-dimensional world are becoming more colorful accordingly, and what we considered as authentic language and authentic materials is always renewed following the rapid change of the digitalized world. This necessitates the incorporation of technology literacy in language education—learning the decontextualized language that has not been modified with the social and cultural features will not satisfy the need of communicating in the contemporary society.

Responsive practical changes made by CALL(TELL) is the mass renewal of design(Levy & Stockwell, 2013). Guided by the re-shaped learning objective, language teaching materials preparation, class activity set-up, pedagogical practice, and learning assessment are the aspects

that are critically re-evaluated in response to the tneed of technology integration (Gacs et al., 2020; Kılıçkaya, 2012). Changes in teaching and learning are not limited to the incorporation of digital device and online platforms. It is also discovered that these 'hardware' changes also lead to 'software' changes of more learner-centered and activity intensive classrooms (Chapelle, 2005), which promotes interactivity in language classrooms and guarantees students' liberty (Beauchamp & Kennewell, 2010; Pang, 2018). A mixed view of technology, while recognizing the revolutionary aspect of technology integration, has been skeptical of its capability to conduct teaching and learning in a comprehensive manner. It is believed that although technology may offer benefits and extends the boundary of resource, accessibility, and global perspective, the learning package that can be offered when sitting in front of a computer could be very decontextualized and mechanical with emphasis on correctness instead of appropriateness (Koua, 2013). Teaching and learning through virtual platforms are hard to match face-to-face version in terms of incorporating nonverbal aids during communication, making interpersonal connections, exchanging feelings and emotions, and embracing flexibility under contexts (Jones, 2004; Meskill & Anthony, 2014; Warschauer, 2004). Language education, following the tide of the technological development, is always under the debate of being urged to incorporate technology as enhanced intellectual capacity and being cautious about the detrimental outcome it may bring to critical thinking of individuals and distorted language ecology as a whole (Chun et al., 2016)

In relation to these on-going changes of re-design, the three-level technology-based infrastructure is being constructed and perfected (Garrett, 2009, p. 720): (1) the setup of teaching and learning space, (2) the institutional professional support structure for technology use, and (3) the national structure of language education and the support structure for it.

The complex conceptualizations of technological elements in language and language

education depicts the everchanging nature of how technology is positioned and integrated into the ways of thinking and doing for both teaching and learning process. Any practice of computer assistance thus should be interpreted with both theoretical and practical evolvement of language learning earning effectiveness.

For language educators, their technology literacy skills facilitate their capabilities constructing the technology-friendly space, incorporating language variations in the digital age, conducting teaching in a technology intensive environment with the assist of digital tools, being direct executor of all changes and making immediate pedagogical decisions real-time in classrooms. Their efforts call for an administrative and school governance force that realizes the value of the digital shift in language and language education, create workplace learning opportunities and help facilitate the development of teachers' profession on technology use specifically in language teaching. This could not come true without a national and social discourse that extends a friendly gesture to technology-integrated language teaching, and provide ideological, policy, and even financial support.

To appropriately apply technological integration in their teaching and facilitate student learning, teachers' professionalism can only be more inclusive and comprehensive. Not only do they need to be technology literate, their competence of applying their acquired literacy skills into teaching practice is also important. In next section, how teaching professionalism, specifically that of language educators, is framed towards technology integration and illustrated in order to identify the crucial aspects that teacher development should focus on.

2.1.3 Technology in language teaching professionalism

Teacher's technology use is evident both in their personal and professional life (Ertmer &

Ottenbreit-Leftwich, 2010; Suárez-Rodríguez et al., 2018) Teachers competence of using technology in their professional life has been considered crucial, and has developed a well-establish position as technology/digital competence. This is particularly true during the time of remote-working and remote-teaching environment (Ferdig et al., 2020; Goh & Sandars, 2020; Quezada et al., 2020; Trust & Whalen, 2020; Whalen, 2021; Yang & Lin, 2020). Teachers as active frontline practitioner of education takes immediate action in response to any contextual changes, the digital change being an emerging and dominating one. World-wide COVID-19 pandemic has made computer-assisted virtual classrooms a norm for those who have computer access. It is not practitioners' choice to discuss the advantages and disadvantages of CALL—it has become an inevitable contextual situation they have to deal with. The emergency of shifting from in-person to online class has exaggerated the challenge of curriculum renovation and pedagogy adjustments. This brings a systematic consideration about how teachers' professionalism could keep up with the technological change.

A three-pillar model of teachers' professional digital competence (Gudmundsdottir, and Ottestad. 2016, as cited in Gudmundsdottir & Hatlevik, 2018, p.7) categories the technology-inspired aspects in teachers' professional life. The first pillar, *Generic digital competence,* refers to the general knowledge, skills and attitudes that one needs to teach and learn in digital environment; The second pillar, *subject/didactic digital competence*, is subject-specific features of technology use in relation to the learning/teaching objective of a given lesson or curriculum; The third pillar, *profession-oriented competence*, includes a variety of aspects that are supportive to the construction of technology-intensive teaching/learning environments. The European framework for digital competence of educators details the elements that are specifically central for educators' professional and pedagogical practice (Redecker & Punie, 2017). Both

frameworks agree that language educators' technology competence can be unpacked into fluency of technology use as everyday skills, educational practice with technology integration, and career-long technology involvement.

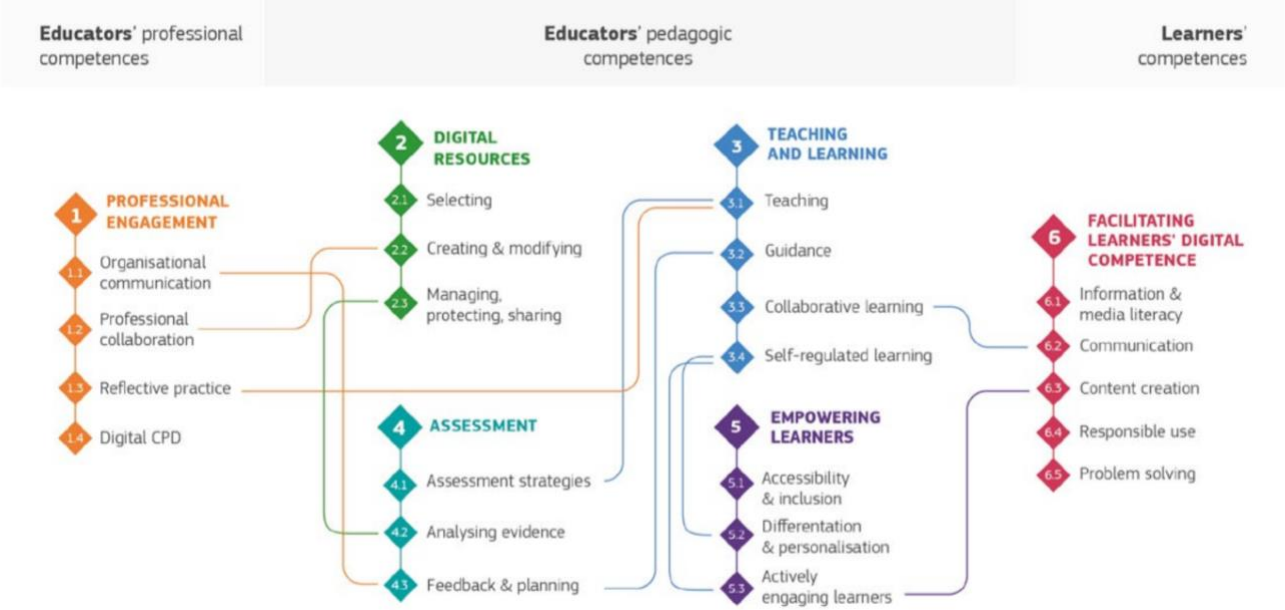

Figure 1 DigCompEdu framework *(Redecker & Punie, 2017, p.16)*

To contextualize it into language education, technology gives birth to evolved conceptualization and social understanding of "language", which urges language educators to keep up with the pace of the digital revolution by renovating their teaching. Conventional language education, summarized in Wong et al. (2015), remains in the pitfalls of 1) the teacher-centered and content-oriented approach; 2) the 'presentation-practice-production' routine that is decontextualized from the scenarios and the culture; 3) the disconnectedness of language skills and knowledge learning. Technology integration opens up chances and challenges for the sociocultural sensitivity that senses language being culturized and communicative. It renovates the object of language teaching and the form of interactions among teachers and students along with the developing information communication technology. Considering the radical changes technology has been bringing into contemporary language education, and expect language

educators use technological tools to enhance the spectrum of language and literacy, apply learner-centered approach to facilitate participatory and communicative learning, and to lead the curriculum planning towards cultivating competent individuals for digitalized social communication (Kessler, 2018). CALL(TELL) researchers recognize the importance of teacher professional development in relation to technology-integrated teaching, and point out that dedicated technological trainings are critical for language educators in the contemporary educational discourse (Garrett, 2009). However, teachers' technology integration is less likely to be well-executed in their teacher preparation experiences as expected. With technology being increasingly accessible for teachers and schools, a gap has been identified among the technology available, technology perceived helpful and technology being practiced (Hew & Brush, 2007). Language educators has not been excluded in such mismatch. For instance, English as a Foreign Language (EFL) teachers are believed to be left behind by the digital change, as they seems unready to use digital tools in their classes effectively due to either a lack of interest in technology integration or rare opportunities to learn how to use technology (Suwartono & Aniuranti, 2019). They present lower commitment to make a digital shift in their teaching practice. Although leaning towards a favorable side when considering technology presence in classrooms, teachers seem not confident enough towards the outcome of student learning with technology aid, thus practice technology integration in their teaching from a limited scope.

Brinkerhoff (2006) results such teacher unreadiness from four aspects: resources, institutional and administrative support, training and experiences, and attitudinal or personality factors. From what has been observed, it is indicated that teachers being engaged in the digital era as individuals does not guarantee a positive and willing attitude towards technology-intensive classrooms and technologically considerate teaching practice. This spawns a teacher

development model that initiates from language teachers' mindset (El Shaban & Egbert, 2018), improves their technology competence in teaching, and encourages teachers' reflexive thinking that can active their possessed knowledge into knowledge-in-use (Gerlach, 2021). These are important in both pre-service and in-service teacher development. In language teacher preparation programs, technology should be embedded in student teachers' learning process with systematic theoretical knowledge delivery, targeted practicum opportunities, and adequate infrastructure support. Luke & Britten (2007) details aspects that are needed in a technology-friendly teacher education program. A curriculum with constant technology focus and an assessment system that is creative to incorporate technology elements should be developed in language teacher education programs. It not only requires the commitment of university to build labs/centers that are able to host workshops for teacher candidates to learn how to apply technology in their teaching and for faculty members to improve their capability to better integrate technology into their academic roles. It also requires administrative dedication of the university to financially support the technology-related changes, and to cooperatively create the culture that encourages exploration and innovation in a technology-intensive environment.

In-service language teachers who are not systematically experienced in technology-integrated teacher preparation programs face similar but more challenging situation than those who are taught and prepared to conduct technology-integrated teaching with explicit digital teaching instructions at their pre-service stage. In Lee & James, (2018), they are given the name of "digital immigrants" (firstly proposed by Prensky, 2001), and are identified with a critical need to be supported by professional learning opportunities to ensure they keep up with the style of language teaching in the digital age. Professional development programs that are specifically for technology use in teaching are found to be helpful in terms of improving language teachers'

digital literacy skills and their ability of using technology in their teaching, but it does not keep constant energy for teachers to enhance their technology integration after the program finishes (Uslu, 2012). Teachers attribute such aftereffect inadequacy to the decontextualization of the technological knowledge being taught, lack of follow-up support to facilitate technology implementation, and insufficient organizational/institutional support. Professional learning communities are formed as teacher-initiated resolution to enhance their digital competence and awareness of the affordance and constraints of technology in teaching. Their attempts of developing a continuous professional development model also inspires the potential of a transformative professional development path for language teachers who need to use, and teach 21 century language and literacy(Lee & James, 2018).

What teacher preparation and professional development efforts have and have not achieved indicates that teachers' digital competence would not be effective enough if not serving the contextualized situation, not appropriately applied in response to the need of their specific classroom, or not becoming the rooted belief of teachers in order to foster a better teaching practice. The effectiveness of teacher development in technology integration is revealed in the changes of teachers' actions and their pedagogical reasoning, which is supported by their cognitive development of being knowledgeable and holding proactive attitude towards technology-enhanced education. In the following two sections, I will depict the intersectionality of technology integration with teachers' pedagogical reasoning and action, as well as with teachers' cognitive development.

2.2 Pedagogical Reasoning and Action

The digital age has witnessed the change of teachers' pedagogical reasoning and action

(Harris & Phillips, 2018; Holmberg et al., 2018; Starkey, 2010) Teachers are expected to take the challenging responsibility of critically absorbing and responding to the social change including the evolvement of technology use in education, and play the central role in pedagogical reasoning and action based on their decision-making in both planning and practicing stage of teaching. Teachers' decision-making, pedagogical reasoning and actions are considered as the mirrors of their profession, because rather than being provided a chance to verbalize what they know and how they think, teachers are busy with doing the teaching in the field, and that represents what they believe and what they value (Loughran, 2019). This section starts with the discussion about the model of teachers' pedagogical reasoning and action and its specification in the digital era.

2.2.1 Pedagogical reasoning and action: A Shulman's model

The model of pedagogical reasoning and action (PR&A) that unpacks the process of teachers' sense-making was firstly proposed in Shulman (1987). When referring to 'reasoning', one may be interested not only in the explanation for the why, but the comprehensive sequence of judgment, decision-making, problem-solving, and the critical thinking embedded underneath (Jeong & Luschei, 2018). Five stages—namely comprehension, transformation, instruction, evaluation, and reflection—are identified in Shulman's model, before a new comprehension is formed as the start of a next cycle (p.15). In each stage, all elements that impact their teaching—such as subject matter, ideas surrounding the discipline, students with various characters (family, social status, language, culture, etc), policy and regulation of all levels, school atmosphere, and teachers themselves—need to be involved and balanced. This presents an inescapable reality of the teaching profession-- that knowing the content knowledge of your subject is far from enough.

Both pre-service and in-service teachers, generally teaching professionals, are expected to understand the subject matter thoroughly, then make it 'teachable' and accessible to their students. Beyond that, to let students understand and utilize the knowledge requires comprehensive consideration that involves tacit knowledge that is contextually evaluated and modified according to the specific class group. The final step is to reflect on the entire process about what has been learnt and what would be meaningful for future teaching.

As argued in Wilkes (1994), the core of teachers' PR&A lies in the stage of transformation, in which teachers, drawing on their comprehension of all elements of their participating educational discourse, critically refine the decontextualized content knowledge considering all the practical aspects they may come across in classrooms, and get themselves prepared for in-class instruction, during which their preparation of teaching is being tried out. Shulman (1987, p.16-17) further identifies steps in the transformation process including: (1) Preparation—teachers examine whether the content is 'fit to be taught', and if so, segment and structure the material to be better adapted to teachers' understanding and suitable for teaching. (2) Representation—teachers develop a representational repertoire that connects their comprehension of prepared materials with students' understanding; (3) Instructional selection—teachers choose from their bank of teaching methods and models that are able to embody their content representation; (4) Adaption—teachers adapt the represented materials considering the need of specific student groups that teach to develop their methods of demonstrating their reformulation of student-friendly content; (5) Tailoring to student characteristics—teacher adjust their materials in response to specific students' needs in their practice. These steps specifically raise the importance of understanding and predicting students' thinking and their needs and the contextualization of the materials according to their specific classroom. Their transformation is

then executed in the stage of instruction, during which teachers deliver their transformed content and observe students' reaction for further adaption, Following the stage that are predominantly thinking and rehearsing, teachers practice their teaching, evaluate their preparation work, and work to develop a new comprehension for future PR&A cycles.

Shulman's model of PR&A helps establish and explain what teacher education program should help teachers to process, and portrays the fuzziness of the teacher preparation (Herman, 1998; Martin et al., 2017; Nilsson, 2009; Peterson & Treagust, 1995; Wilkes, 1994). Teacher education inspires student teachers to start from better equipping themselves with knowledge and mindset to take responsibility of the ever-changing situation taking place in a classroom. As a sandbox, these trainings expose pre-service teachers to the skills and strategies needed in their prospective teaching practice, provide them with transformative practicum opportunities to observe and test out what they have learnt, then comprehensively evaluate their learning so that they can critically reflect on what they have witnessed and practiced. Already being practitioners in the field, in-service teachers are also engaged in the steps of learning from professional development programs, teacher meetings and teacher collaborations about the contextualization of their subject expertise in response to the circumstances of each classrooms, renew what they consider as appropriate accordingly, then practice with enhancement, and reflect for further improvement (Biggers et al., 2013; Horn, 2015; Pella, 2015; Tsai, 2020).

2.2.2 The technology turns of pedagogical reasoning and action

Recent trend of teachers' PR&A research reflects the essentiality of technology in the field of education as an emerging contextual element of education. Being integrated in Shulman's PR&A model, technology is integrated in the cycle as an add-on value. Feng and Hew (2005)

deconstruct and reconceptualize the PR&A process of K-12 teachers when technology is involved in their day-to-day pedagogical practice. Technology influences are discovered in teachers' consideration about students' learning stages during the preparation stage, as well as the interaction and activity design during instruction. Selection of technology tools and the caution that are given to technology application are identified in addition to the original PR&A model. This indicates that technology integration is not merely to use newly developed tools to teach the same contact, but to reshape the interpretation of content knowledge and the bridge between these teachers' interpretation and students' understanding. The changes in multiple stages of PR&A cycle is reflected in Starkey's (2010) updated model of teacher PR&A for the digital age based on Shulman's work (see Figure 2).

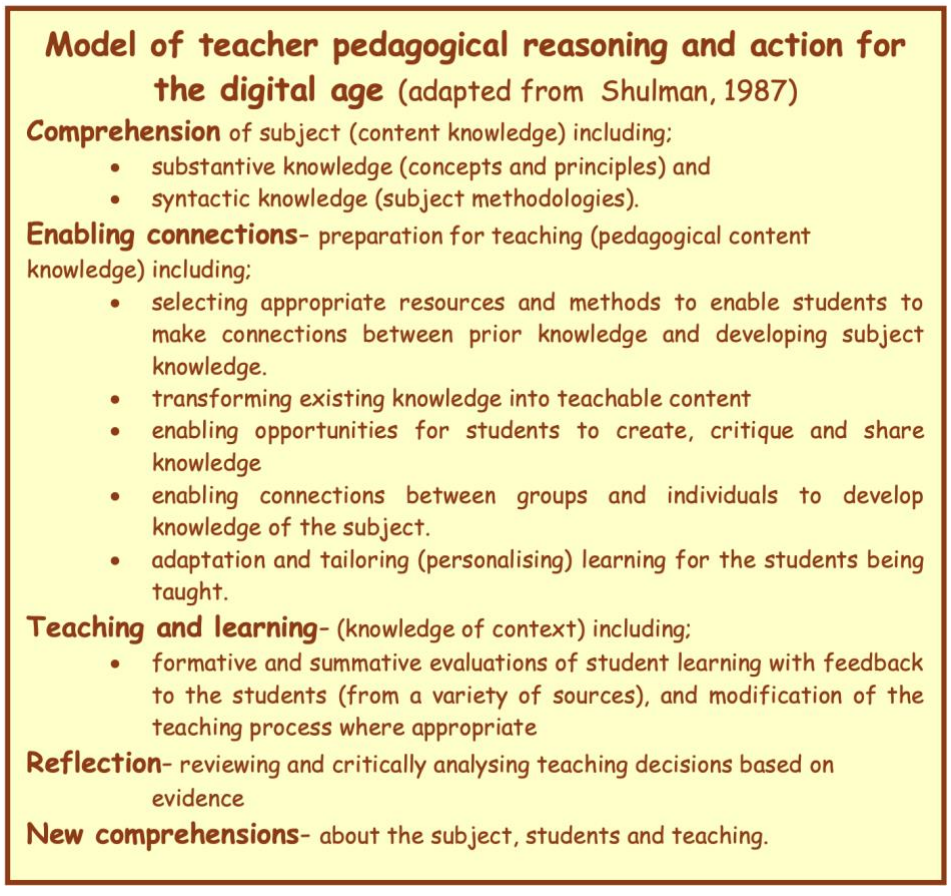

Figure 2 Model of teacher pedagogical reasoning and action for the digital age (Starkey, 2010)

Here, the stage of transformation in Shulman's model is unpacked as the preparation of technology-integrated pedagogical content knowledge construction and the renewed form of connection among individuals in the teaching and learning community. Beyond framing teachers as the agent to transform and deliver knowledge, this updated model emphasizes the active role of technology in a more constructive knowledge system and a more interactive mode of connection that facilitates teaching and learning.

Teachers' awareness-raising and learning about technology-impacted elements in their teaching preparation, teaching practice and reflective thinking throughout their PR&A process is thus believed to be important, as investigated in Niess & Gillow-Wiles (2017). Teachers are reported to regard technology as a supportive aid to their instructional goals, and as forms of inquiry, collaboration, and communication among them. Beyond building the knowledge around technology use, they work as a community to learn from their conducted technology-related practices and the electronic portfolio they collected.

Teachers' consideration about technology integration, despite of the everchanging conceptualization of technology shift, are not thoroughly renewed. Hofer & Harris (2019) specifically focus on teachers' instructional planning stage and discover a limited technology considerations during their initial planning sessions. Teachers are not fully prepared to genuinely incorporate technologies to their planning aids package, and the integration of technology into the designed instruction and learning activities cannot dominate the consideration of curriculum content and pedagogical choices that are carried on from a traditional manner. Similar findings are also presented in Holmberg et al. (2018), in which pedagogical value is being essentialized as the key feature of technology integration. Teachers' attempts of student-centered lesson planning, updated instructional strategies, and innovative student engagement stimulation are

complemented with the integration of technological tools. Rather than shifting their conceptualization of the content and the gesture they approach the entire teaching process, they utilize technology in student motivating, material preparing and presenting, in-class activities design, student assessment, and course evaluation as add-on.

Differences and disputes are also observed among individual teachers when incorporating technology into their existing PR&A process (Trevisan & Smits, 2021). Variations of core concepts and orientations form three profiles that indicates different PR&A characteristics and the modalities of technology integration. Those who performs a strong teacher control and dependence on routine teaching apply technology integration to repetitive drills for knowledge transmission and teacher workload reduction. Those who show willingness to establish their own agency based on the existing content and pedagogical plan expect technology to supplement more activity-driven teaching practice and deep-learning initiatives. Those who focus more on the conceptual level of learning process and practice diversified approach in response to learner needs essentially integrate technology to facilitate deep learning in addition to its functions of drilling and reducing teacher workload.

In a survey conducted in Ontario, Canada (DeCoito & Richardson, 2018), types of technology that are practiced by frontline teachers include (but not limited to) digital cameras, presentations, tablets, simulation and emails, video games & social platforms, class planning tools, etc. These types of technology are expected to help with accessing additional resources, creating innovative representations of information, facilitating communication and collaboration, simulating the real-world situations, supporting problem-solving and higher-order thinking, and beyond. The outcome expected out of technology integration goes beyond using technology as learning facilitating tools, but also legitimizing technology as an important component of

contemporary literacy.

Practically speaking, however, teachers' pedagogical practice in relation to technology integration witnesses great individual variations. Teachers' decision making and action are influenced by complex factors of teacher preparedness for technology integration, teachers' philosophy and beliefs about technology, and teachers' perceived utility value of specific technology-enhanced teaching efforts. Three barriers of for pedagogical reasoning and action in relation to technology integration are identified in Forkosh-Baruch et al. (2021, p.2211) as:

- absence of widely accepted integrative teaching models that consider teachers' attitudes, beliefs, dispositions and knowledge, to better understand their PR&A and decision-making processes concerning technology integration
- lack of adequate practical-authentic experience for preservice and in-service teachers resulting in limited opportunities for PR&A and decision-making concerning technology integration.
- use of simple adaptive software that automates classroom decisions, thereby reducing teachers' roles regarding PR &A and decision-making.

And the three responding opportunities includes:

- Connecting knowledge and action in technologically-rich contexts.
- Promoting PR&A of pre- and in-service teachers
- Designing PR&A and decision-making for software that automates classroom decisions

In order to overcome the barriers and seize the opportunities, it is important to understand that PR&A, the essence of teachers unspoken wisdom, is closely relevant to teachers' thinking and sense-making as well as their situated positionality of teaching. Windschitl & Sahl (2002) describe that teachers' technology integration is dependent on multiple factors including

teachers' belief, institutional context, administration leadership, accessibility to resources, relationship building with learners and fellow teachers, and more. If teachers' PR&A identifies the shifts that are made and practiced in their teaching, investigating teachers' thinking and processing system attempts to answer the question of why such decision and practice can be made. Teacher cognition is believed to be the underlying origin of teachers' decision making, and explains teaching behaviors in their planning and practice (Borko & Shavelson, 1990).

The complexity of technology integration and its implication of teacher preparation are evident in teachers' change in their sociocultural awareness of individual and organizational background, forms of teacher beliefs, and technology-integrated teacher knowledge to portrait teaching profession in this era. These elements in teacher changes have been detailed in the framework of teacher cognition, which will be unpacked in the following section.

2.3 Teacher cognition and technology integration

Teachers has once been conceptualized as merely transmitter of knowledge, and their learning to become teaching professionals has been limited to the mastery of the content knowledge and the pedagogical skills to transmit content knowledge from their brains to students' side (Freeman, 2002). However, such understanding of teachers and teaching profession instrumentalizes teachers instead of regarding them as active thinkers and decision-makers. In this section, I start from unpacking the complexity of teachers' mindset which would play a critical role in their pedagogical reasoning and actions, then discuss how technology has been integrated inside.

2.3.1 Teacher cognition and its constructed evolvement with technology integration

The notion of teacher cognition has not become popular until late 20th century—although a multitude of terminologies embraced inside has been extensively discussed previously. Under the general definition of "what teachers know, believe, and think" (Borg, 2003, p.81), teacher cognition has been perceived as a dynamic mental construct. Features of teacher cognition is depicted as tacit, personally held, practical and dynamic(Borg, 2015, p.40), which emphasizes teachers' sense-making processes and their thoughtful behaviors accordingly. In a review of literature made by Clark & Peterson (1986), teachers' knowing, thinking, planning, and decision-making are believed to be psychologically constitutive for teachers' action-taking--all these components are interrelated and unneglectable. This implies the theoretical foundation of teacher cognition at the intersectionality of cognitivist and constructivist perspective, Piaget has been the pioneer of theorizing such cognitive constructivism. In his theory, all the information that one received are constructed in his/her own mind (Piaget & Cook, 1952). New information coming to one's existing schemas is assimilated then accommodated by the existing schemas, thus an equilibrium of cognitive stability is achieved by the continuously balancing of assimilation and accommodation (Kumar & Gupta, 2009). Cognitive constructivism explains how individual access and interpret new knowledge and information in his/her own manner, and how existing knowledge system evolves comprehensively. The cognitive construct of teacher cognition[1] has been developed and summarized in the Borg (2015) framework (see Figure 3 below). This framework explains the multiple aspects that teacher cognition is constructed from. Derived from one's personal and educational experiences, teacher cognition is further established, and also reacts upon one's teaching practice in classrooms, flow of professional growth, and the

[1] The specification of language teacher reflects Borg's scope of research, the standing point of his teacher cognition framework does not have a specific disciplinary limit

environment that teaching is conducted. Borg (2019) later synthesizes the establishment of teacher cognition as an umbrella term with componential elements. Subordinate elements encompassed inside include (but not limit to) well-recognized terms of teacher belief and teacher knowledge, as well as more non-behavioral terms such as teacher motivation, teacher commitment, teacher resilience and teacher identity (Borg 2019, p.1152). Besides individual

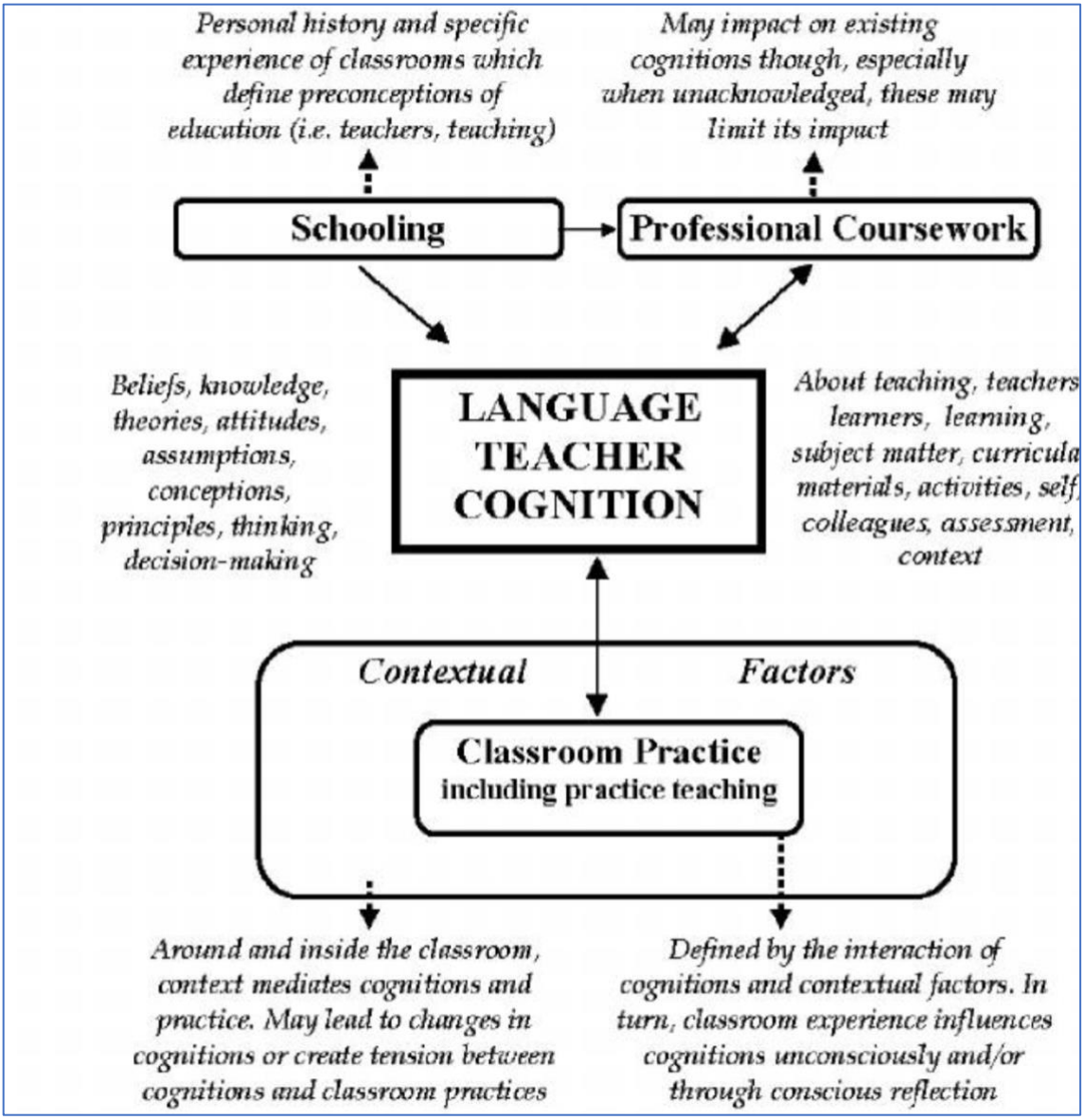

Figure 3 Borg's framework of (language) teacher cognition (Borg, 2015, p.333)

teachers' trajectories of prior knowledge acquisition and other accumulations they have had

along their career, teacher cognition, as a constructed cognitive entity, is conjunctively composed by the social and contextual discourse. Of great importance is the tone set by the whole society, the institutions/organizations that teacher work for, and the situated practice that are conducted in specific classrooms. The factors and the dynamic among those are identify by Macalister (2010) as Figure 4:

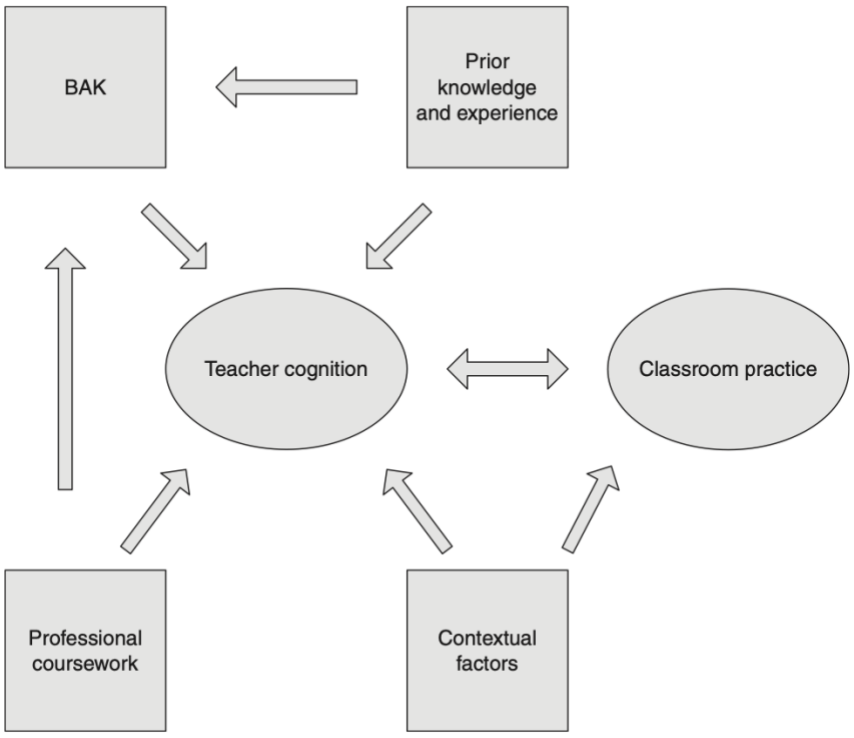

Figure 4 Factors and dynamic of teacher cognition (Macalister 2010, p.62)

This presented dynamic of teacher cognition factors has the following three indications. Firstly, the integration of "BAK" at the upper left corner recognizes the components of teachers' mindset about teaching and learning in general. In Woods (1996), A network of BAK (belief, assumption and knowledge) is proposed in order to explain teachers' thinking and decision making. In his later work, Woods with his colleague explains that the interrelation among belief, assumption and knowledge are because teachers' knowing, both subjective and objective, both conscious and unconscious, dynamically shape teachers understanding about specific teaching and learning

practice, and about the teaching profession in general (Woods & Çakır, 2011). Secondly, teacher cognition is closely interrelated with how teachers practice in classrooms, both how they teach and what professional learning could be accomplished in the meantime. What teachers experience in classrooms, accompanied by other contextual factors, constructively shapes the sociocultural determinants of teacher cognition. On the other way around, teacher cognition can be traced through teachers' activities, and their changing narratives about what they think, and what they do. Understanding teacher cognition includes investigating the individual comprehensively in order to gain insight on how a specific teaching (or teacher learning) moment take place as such, and on how teacher cognition can potentially enhance the meaningfulness of teachers' future teaching practice. Thirdly, teachers' contextual knowledge and awareness should be considered as critical in shaping their cognition scheme and inform their everyday teaching.

The digital era has been a critical contextual factor that the cognition of current teachers cannot ignore. Technology use, as a key element of teachers' practice, is vital for constructing teacher cognition in the contemporary educational context. Teachers cognition about technology are reflected their conceptualization-in-practice and application of technology in their teaching, learning, and administrative work (Li, 2020, p. 174). Technology elaborates on the constructivist nature of teacher cognition as it generates the discussion of how teaching and learning would integrate technology as building blocks to reshape or further construct what they have had previously. With their rapid development in the digital era, forms of technology that are commonly used and taught in teacher education programs are likely to be in need of renovation during student teachers' attempts to become a professional teacher. Also, these changes of how technology could be used in teaching are not likely to slow down throughout their career,

meaning teachers constantly need to renew themselves to keep digitally competent. Established cognition of teachers thus plays the dominant role of deciding how technology integration is perceived (Ertmer, 2005), and informs the direction of their cognitive development overtime.

Considering technology as a critical part of teaching and learning, teacher cognition framework with technology integrated is further adapted in Forkosh-Baruch et al., (2021). As seen in Figure 5, drawing on the teacher cognition framework of Borg's, their conceptualization of teacher cognition (the ABTI model) specifically points out its interrelationship with teachers' PR&A. The PR&A practiced by a teacher is comprehensively represents the interconnectedness of teacher cognition as an individual, the context that is recognized, the classroom practice that is made and reflected upon, as well as the communities of practice that teachers participate in (e.g. co-teaching or collaborative teaching preparation groups). Another specialty of the ABTI model is that it elaborates on the community nature of teacher cognition construction by absorbing a community-influenced epistemic frame of teacher cognition called SKIVE (Skill, Knowledge, Identity, Values, Epistemology) proposed in Shaffer (2006). Teachers' sense-making of discursive technology integration decisions and actions are justified through epistemological concerns of teachers in addition to their existing knowledge and belief – in other words—one's property of teacher cognition is evaluated and reflected by oneself and become an additional layer of epistemological understanding.

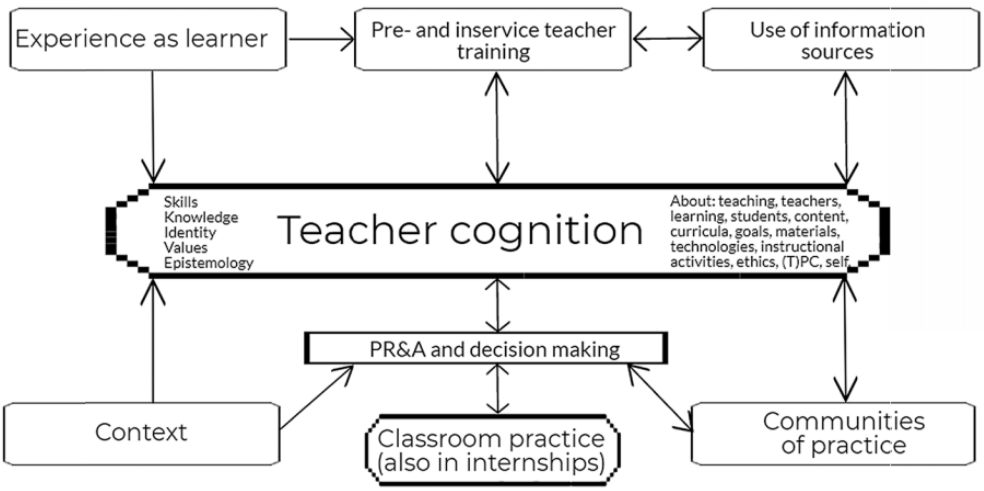

Figure 5 ABTI model (Forkosh-Baruch et al., 2021, p.2213)

Kitchner (1983) explains the epistemological perspective of a cognitive process in a three-level model that monitor individuals' problem solving, epistemic cognition (EC) being the third level. In comparison with level 1 (individual cognitive tasks of knowledge construction) and level 2 (metacognition about how to monitor and strategically solve the tasks in cognitive processes), level 3 epistemic cognition monitors the epistemic nature and the truth value of the alternative solutions when facing challenges and problems. It "leads one to interpret the nature of a problem and to define the limits of any strategies to solving it" (p.226). Five clusters of cognition components are identified in the model of EC: Epistemic aims and epistemic value; Structure of knowledge and other epistemic achievements; Source and justification of knowledge and other epistemic achievements together with related epistemic stances; Epistemic virtues and vices; Reliable and unreliable processes for achieving epistemic aims (Chinn et al., 2011, p.142). This five-component framework draws attention on the situatedness and the developmental nature of EC, while keep the awareness of the social aspect of EC when examining the aggregation of individual epistemic practice or the practices of specific learner groups.

Research in the area of epistemology cognition shows that beliefs about knowledge and

knowing follow specific development paths (B. K. Hofer, 2001). This originates from Perry's (1968) scheme of a person's cognitive ad ethical development distributed along his/her adulthood. When a specific problem/challenge is vibrant and its social meaning become critical to individuals or collective groups, studying one's EC is extremely meaningful, because this is a first-hand interpreter of changes and developments made under those specific circumstances. Teachers' EC under a specific context of social and institutional change is critical to understand their current and future direction of teaching practice. Investigating the process of individuals' (in our case teachers) epistemological development in terms of knowing and justifying their knowledge, skill sets and the social discourse of teaching provides valuable insight about their future professional development on possible directions of fostering effective teaching practice (Maggioni & Parkinson, 2008). The process of teacher professional learning is dominantly consist of reflective thinking and action taking (Feucht et al., 2017), especially when they are practitioners in the field and truly face challenges and need to take immediate actions. Proposing the idea of epistemic reflexivity draws great importance on teachers' reflection as an aid to promote their epistemic cognition changes (Lunn Brownlee et al., 2017). By proposing the 3R-EC Framework (Reflection Reflexivity and Resolved Action), Lunn Brownlee and colleagues suggests that teachers reflect on their teaching practice and epistemic aims in response to the discerning issues they have come across, then engage in deliberative reflexive thinking to evaluate their knowledge and viewpoints about their practice of epistemic aim achieving. These two steps of self-reflection and internal negotiation consolidates teachers refined/evolved practices that apply epistemic changes and facilitate teacher development.

The elaboration of epistemological layer in teacher cognition has two indications. Firstly, it emphasizes the developmental nature of teacher cognition along their professional paths, with

close relation to their teaching practice, social and institutional discourse, routes of professional growth, and more. Secondly, it draws particular attention to teachers' reflexivity in terms of how teachers' reflective thinking shapes and shifts their cognitive development as well as their future action-taking. Technology coming into play indicates that the construction of teacher cognition is unescapably influenced by the incorporation of technology, and it is important to portray how. In next section, I brief about how technology is integrated in elements of teacher cognition. I start from depicting the current status of technology-integrated teaching practice, and then dig into the elements that contributes to such situation.

2.3.2 Technology-integrated elements in the teacher cognition construct

As the direct participants in educational practices, teachers need to be conscious and responsible towards the implementation of technology integration in their teaching practice, but in reality, it seems not to keep up with the pace as expected. The problematic situation of lower-than-expected technology integration carries on. Research have shown that teacher preparation programs have been constantly working on including technology element into their curriculum and/or program plans. For pre-service teachers, both coursework and practicum opportunities are offered to combat major challenges for student teachers to perform technology-friendly, including: (1) student teachers' instrumentalization of technology integration: they tend to focus extensively on the practical skills of using technology as tools in teaching rather than the ideology and perspectives behind technology use; (2) student teachers' disposition about technology integration: their limited understanding of how technology can be deeply embedded in their teaching, which make them less willing to actively make new attempts; (3) student teachers' lack of field experiences: with the concern of technological resource accessibility and

the limited chance they have to practice in authentic classroom settings; (4) teacher educators' less preparedness with teaching technology integration; (5) student teachers' sense of uncertainty towards technology implementation—all these factors presented above leads to teachers' lack of confidence towards technology-integrated classroom and their hesitation putting what they learnt through teacher training into practice(Admiraal et al., 2017; Downing & Dyment, 2013; Nillas, 2008; Tondeur et al., 2017). Student teachers require a more intensive practicum experience to truly implement their technology related knowledge and skills into practice (Mouza et al., 2014; Polly et al., 2010) .When it comes to in-service teachers, teacher development opportunities are provided to foster stronger skills and belief towards technology. Technological facet has become the central element of current teacher qualification considering the involvement of technology integration in the active curriculum (Huhtala & Vesalainen, 2017). For those teachers who are already in the field with comparatively limited exposure to technology, the need for over-time professional development activities rather than quick in-and-out workshops for technology integration is reported, as this provides on-going support opportunities for teachers' follow-up learning and feedback (Lawless & Pellegrino, 2007). In-service teacher learning can be relatively more experimental with the collaboration of service learning community and the support of administration and management (Salam et al., 2019).

Windschitl & Sahl (2002) argues that teachers' technology integration is dependent on multiple factors including teachers' belief, institutional context, administration leadership, accessibility to resources, relationship building with learners and fellow teachers, and more. Such complexity of technology integration and its implication of teacher preparation resonate with the framework presented by Ertmer & Ottenbreit-Leftwich (2010), which regards teachers' knowledge and skills, self-efficacy, pedagogical beliefs, and school/subject culture as key

variables. Proposed implication and potentials for both pre-service and in-service teachers indicates that a multitude of variables come into play when teachers consider their innovative practice and technology integration in their practice. The significances of the key variables are unpacked below:

2.3.2.1 Teacher knowledge about technology-integrated education

Teacher knowledge, especially that in the 21st century, draws special attention to technology integration while remain the focus on disciplinary and pedagogical matters (Kereluik et al. 2013, p.132-133). Technology-integrated teaching should, by its name, include teachers' use of technological tools, which clarifies the meaningfulness of familiarizing teachers with these technology skills. But as a constructivist component of teacher professionalism, it should be equally (if not more) important to understand the ways in which technology reshapes the teacher knowledge of all aspects with the technological turn. Elaborating on the concept of teachers' Pedagogical Content Knowledge (PCK) (L. S. Shulman, 1986), a technology incorporated teacher knowledge framework, TPACK (technology pedagogical and content knowledge, see Figure 2), is firstly brought up by Mishra and Koehler (2006). It demonstrates how technology is integrated into the interwovenness of pedagogical and content knowledge within a specific context.

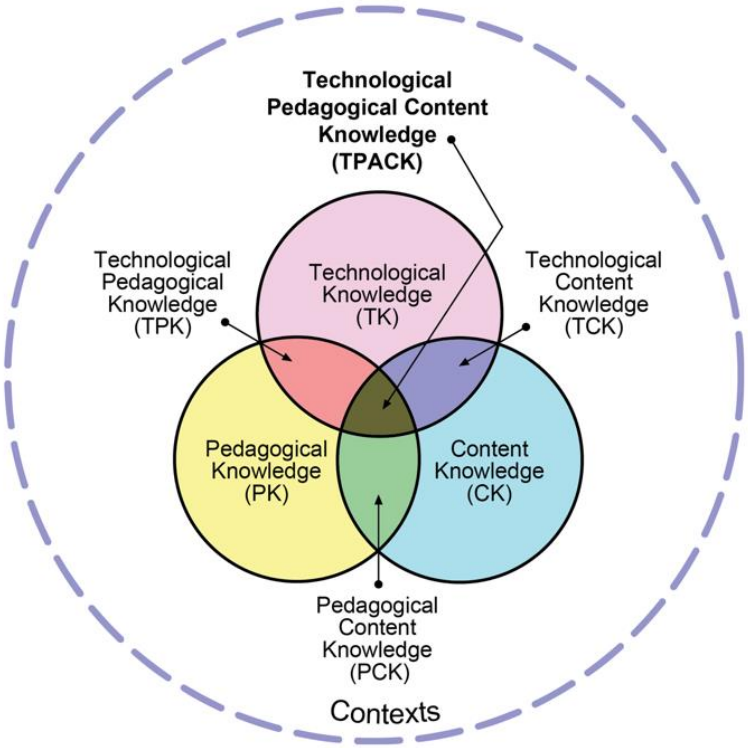

Figure 6 TPACK framework (Mishra and Koehler 2006)

Existing body of teacher knowledge system, enriched by technology (T-), considers teachers' competence in sense-making for the content to be taught (T-content knowledge, TCK), the resourceful introduction of the content that they provide to bridge students' understanding (T-pedagogical content knowledge, TPCK), the revolutionary/innovative ways they facilitate interactions and communications among teachers and students to better facilitate students learning (T-pedagogical knowledge, TPK), and the interpretation of the sociocultural contexts in relation to the educational practice(T-context awareness, which, as discussed below, relates to the culture of school and society). This indicates that teacher educators, collaborative teacher groups and researchers should not only take a narrow sense of technology-related issue such as how to use a software or how to run the platform, but also the comprehensive evolvement of the educational ecology shifted by the technology components.

Informed by the special attention on the context element of teacher knowledge (Margerum-

Leys & Marx, 2002), the extended understanding of technology-related teacher knowledge specifically focus on the social change and the contextual awareness that teachers need in order to put technology in a critical position. This not only refers to the sensitivity to the contextual confrontation of their in-classroom technology application as a strategy to practice effective teaching, but also the critical considerations of those systematic and social changes in relation to this. Social justice and ethical issues are of great concerns (Selwyn, 2010) in terms of how the technology-infused social dynamic allows or limits the fair share of power of speech, decision-making, resource distribution, and accessibility. It is also worth considering how technology use exaggerates vulnerability of learners when trying to participate in the everchanging educational system. For teachers who are pioneers in the field and the first responder of these issues, contextualized TPACK backbones their pedagogical reasoning and action, as well as their critical evaluation of what they could offer to their students and the society. The ways in which teachers' mastery of technology-integrated knowledge is represented in their practice as their technology competency (Tai, 2015, p.153), which is evident in the following aspects:

1. Scaffolding content (i.e., modeling scaffolding techniques in order to promote learning with technology)
2. Assess learning (i.e., using technology to assess students' learning)
3. Resources content (i.e., resorting back to resources from workshops, conferences, etc.)
4. Engage (i.e., motivating students through the use of technology)
5. Match affordance (i.e., selecting technology based on "what the technology can do (affordances) and [cannot] do (limitations)"
6. Reflect (i.e., critically reflecting technology use in connection to content and pedagogy)
7. Collaborate (i.e., cooperating/team-teaching with others)

8. Learner-centered (i.e., allowing learners to be in control)

9. Connect learning (i.e., enabling students to connect and cooperate with others).

Teacher knowledge recognized in these aspects above requires more than possessing the knowledge needed. These seemingly categorized strands of knowledge and the step-by-step specification of how knowledge would apply, I will argue, should be understood as constructive factors of ·1· - teachers' practice. No matter how well-established technology integration is in teachers' knowledge system, it will not be put into practice unless teachers make commitment to do so. Teacher belief in technology-integrated education could be one of the indicators how teachers make sense of what could be done with technology integration, and how those could be practiced along this journey.

2.3.2.2 Teacher belief in technology-integrated education

The formation of teacher beliefs is accumulative. It is constructed by chances, events and experiences that one has along their life timeline. Along their life and educational experiences, teachers develop their own perceptions about the social and institutional context, learners, curriculum, teaching and learning process, and themselves, and compose their own version of teacher beliefs (Li, 2013).

How do teachers believe in technology integration is critical. In a traditional classroom, teachers are the stakeholder about when and how would technology come into play (Arnold & Ducate, 2015). They make the decision and conduct the practice depending on their own "interest and enthusiasm" (Ware 2008, p.48), and their perceptions about the situated applicability of technology. With the emerging and popularization of new technology, research across the globe have been attempting to understand and explain the models of how technology

has been accepted and adapted by teachers (Admiraal *et al*, 2017, Todeur, 2008; Tubin, 2006), and reached the conclusion that teachers' belief and commitment of technology integration remain on a conservative path. This is attributed to the fact that experiences that come earlier in one's life tends to color or assimilate the later experiences to fit in the existing interpretations (Pajares,1992). This suggests a 'first come first serve' policy for teacher beliefs to be sketched by teachers' previous experiences, and it is not an easy task to innovate the self-consistent teacher beliefs with something new. Hesitation of incorporating technology confidently, efficiently, and professionally into teachers' practice is empirically discovered from teachers across different grade level and subject matters (Alenezi, 2017; Ertmer, 1999; Heinonen *et al*, 2019). But where are the pain points? Is it that teachers do not hold a positive attitude towards their own efficacy teaching with technology, or that they do not hold a positive attitude towards the pedagogical application of technology in classroom in general?

The relationship teachers' pedagogical belief and technology use has been widely discussed, yet not reaching a universal agreement in terms of the correlation between pedagogical beliefs and technology use in real-time classroom (Tondeur *et al*, 2017). Instead of positively influencing teachers' technological-related practice in classrooms, teachers' pedagogical beliefs have always remained a critical relationship with their technological-related practice, meaning they do not always appear positive for technology integration. In the study conducted in two Singaporean schools, Lim and Chai (2008) identify significant influences of teachers' pedagogical beliefs on their effectiveness of technology-integrated teaching. They categorize pedagogical beliefs held by teachers into '*traditional'* and '*constructivist'*, then find that the unsuccessful planning and conducting of technology-integrated teaching is largely dominated by the *traditional* pedagogical beliefs. Such 'stick-with-tradition' pedagogical beliefs stem from the

educational history of individual teachers, which is ideologically unfamiliar with constructivist perspectives of teaching and learning, subscribe to a teacher-centered approach, and prioritize the product of learning before the process. With the accumulative experiences being students and teachers in a traditional manner, their technology-friendly beliefs resist to develop. *Constructivist* pedagogical beliefs, on the other hand, are constructively cultivated by one's experiences and uptakes from the social and intellectual innovations. Teachers with such beliefs—regardless of subject areas—are more likely to subscribe to a learner-centered perspective, hold more faith in technology integration implemented in their teaching materials and activities, and believe students would learn differently with these constructive changes (Li, 2013; Sang *et al*, 2010). Teachers who lean more towards traditional rather than constructivist pedagogical beliefs may squeeze technology use into their traditional ways of teaching, which results in a superficial shift of teaching platform and materials without an active update about the underlining logic and mechanism of teaching.

When narrowing the lens from pedagogy in general to individual practices, self-efficacy belief is closely related to teachers' perceived effectiveness to encourage student learning and engagement, thus critically impact their confidence about their future teaching (Tschannen-Moran and Hoy, 2001; Woolfolk and Hoy, 1990). Teachers' self-efficacy, being teachers' contextualized belief of themselves being able to perform as effective technology users, is crucial for teachers' technology implementation practice into their educational practice. It is repeatedly reported in empirical research that teachers' expertise of general technology use, though of great importance, cannot fully represent teachers' fluency of integrating technology into their daily practice (Henriksen *et al*, 2019; Plair, 2008). While technology expertise refers to objective skillfulness of operating technological tools, technology fluency in teaching is considered

heavily dependent on mindset for teachers to fully engage technology into their thinking and practice of teaching faithfully and confidently, which not only represents their proficiency of using technological tools but also their perceived effectiveness to enhance students' learning experiences through technology integration.

The positioning of technology in teachers' belief and attitude is developmental and situational. It intertwines with teacher knowledge that is activated and applied in teaching practices (Abelson, 1979; Calderhead & Robson, 1991; Eraut, 1985; Goodman, 1988; Nespor, 1987; Posner et al., 1982; Schommer, 1990). Here stands out the contextual element of technology integration, which are important in both teacher knowledge (see TPACK in section 2.3.2.1) and the situational teacher belief. Teachers being aware of these contextual elements would impact their cognitive develop of how technology would play its role in their teaching.

2.3.2.3 Teachers' sociocultural awareness on technology integrated education

Technology is not standardized and unconditional. Its educational integration cannot escape from the context of schools and lives, or what Ertmer and Ottenbreit-Leftwich (2010) call, individual and school culture, which are influential variables to shape teachers' technology integration in a given sociocultural setting. As a relatively new infusion and new practice expected under a specific educational context, educational technology is experiencing a complex process to be customized, adopted, and accepted. Teachers are active agents for this, and they do not do it impassively. Sensing the influencing factors (external and internal ones) are crucial in teacher awareness about their positions and missions (Ertmer,1999). External factors, especially barriers, are commonly elaborated by the in-service teachers--including insufficient resources, facilities and support provided for classroom integration of technology. Also, teachers resonate

with their lack of agency making technology-intensive turn due to the limitation of curriculum design, technology-friendly teaching materials, standardized assessments, non-constructivist institutional regulation, time restraint for class, the accessibility to resources, and more (Hamutoglu and Basarmark, 2020; Hsu, 2016; Kopcha, 2012; Yan et al, 2012;). This reminds us that external factors are socioculturally contextualized in educational institutions and systems that teachers have to navigate themselves through.

Individual teachers' cultural background and personal experiences, on the other hand, can be important tone-setting internal factors to shape teachers' preparedness for technology implementation. Teachers' cultural and educational background fundamentally influence their trajectories of development, which would ultimately be reflected in their practice and perception around technology. Such correlation between teachers' personal and educational histories and their technology-integration practice is also discover by Belland (2009) based on the theory of habitus. This reminds researchers to investigate into personal and non-professional background of individuals teachers as 'individual culture', which can be part of internal factors (either accelerator or barrier) for technology integration.

All the elements mentioned above indicates that teachers' cognitive development regarding technology integration in their teaching should not be neat and predictable. It is pursued while teachers are living their personal and professional life. As one of the major arenas of teachers' informal learning, teacher communities allow teachers not to face the challenges alone. In next section, I will propose the notion of collaborative teacher preparation as a task conducted in teacher groups where they work together towards preparedness of both teaching a specific course as well as being responsive to learnings' needs and contextualized elements that apply to their teaching practices.

2.4 Teacher learning through collaborative group

Teacher communities, or collaborative teacher groups, are always considered as one of the epic centers of teacher learning. As stated in Little (2002), collaborative teacher groups supply teacher learning and practice with intellectual, social, and material resources. It is considered as a workplace teacher development opportunity that emphasizes on the teachers' peer learning during situated interactions. Collaborative teacher groups exist in different forms and have been understood in various ways in previous research. Here I specifically introduce the term of collaborative teaching preparation (CTP) as the approach of constructivist teacher learning in a teacher group based on the critical understanding of previously proposed forms of collaborative teacher group. CTP is conceptualized from the mechanism of teacher groupworks, as the approach for teachers to constructively develop their teaching profession, in order to understand teachers' efforts to share thoughts and reflections about teaching contextualized in their specific school setting with specific student groups. In this section, I draw on a critical synthesis of previously conceptualized forms of teacher groups to explain the specialty of CTP groups from a constructive perspective.

2.4.1 CTP for teacher preparation: a constructivist perspective

Community of practice (CoP) is a well-developed theory in the field of teacher collaboration. Firstly brought up by Wenger (1998), CoP refers to the group of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly. Characters of CoP include: (1)The Domain—joint enterprise, which presents the commitment and competence of community members hold to proceed towards the same

direction; (2)The Community—mutual engagement, which brings together the member of community in order to participate in their life and work; (3)The Practice—shared repertoire, which is not limited to the common interest, but also the set of resources, toolkits, network and strategies to deal with problems and challenges (Cochrane & Kligyte, 2007; E. Wenger, 2011; E. C. Wenger & Snyder, 2000). CoP's hosting of teacher learning and indicates that it is fundamentally a space for teachers' social practice, with individual teachers socializing and interacting with each other, and reflecting on their shared thoughts (Lave and Wenger, 1991). CoP members come together with the same goals and work towards the same direction, but this does not mean that the community is a product-oriented organization that expect specific outcome of learning in a settled period of time as a project. Rather, learning occurs during the social participation of members when common interests, resources and networks circulates in their communities. This 'legitimate peripheral participation' (Lave and Wenger 1991) de-identifies the teacher group from its expertise in concentrated curriculum planning, pedagogical specification, and other elements that require teachers' efforts to fit in, instead emphasizes their connections within the CoP groups as humans.

Professional learning community (PLC), is framed slightly differently as a form of professional development groups for teachers' enrichment as a group. PLC is also one of the major and realistic learning spaces that is practically shared in teachers' work-oriented contexts. PLC is identified to be institutional and result-oriented (Hord, 1997; DuFour, 2004) compared with the voluntary and need-oriented CoP. It particularly pays attention to how teachers and school administrators work collaboratively to make wise curricular, instructional and organizational decisions by distributing leadership, endorsing dialogue and promoting ideals of democratic organization and relational community (DuFour and Eaker, 1998; Gragam, 2007).

The underpinning pre-assumption for the organizational configuration of a teacher community is that individual teachers group up for situated goals of teaching and optimizing the outcome of teaching and learning. It also indicates that these PLCs form and fall apart along with the rise and fall of the organization and programs, and work towards maximizing the effectiveness of teaching and learning strategically. This indicates that in comparison with CoP, which focus on the social process of interaction among teachers, the 'community' in PLC specifically shed lights on the outcome of student learning as the ultimate motivation of collaboration, which means changes and improvements are expected as the immediate product in these PLCs.

Forms of collaborative teacher groups can hardly be listed till saturation. Besides the mentioned two conceptualizations, there are also teacher communities by the name of *'collaborative lesson planning groups'*(Bauml, 2014; Wang *et al,* 2015) and *'curriculum design team'*(Kwon et al, 2014; Voogt *et al*, 2016), etc., which explicitly name themselves after the objectives of such teacher collaboration. Bringing together these forms of teacher groups is not to distinguish one from another. Rather, it is to understand various mechanisms how teacher communities are formed. Question has been brought up about the nature of workplace teacher collaborative communities(Stanley, 2011)—are they designed as training space for teachers to achieved uniformity of a "best teaching practice", or are they approaches to empower teachers with the right to make appropriate decisions of their own?

This is by no means a 'one or another' question. Objectives of these collaborative teacher learning efforts initiate from interactions and the socializations among the community members and explore mechanisms that fits their needs. In this study, my proposing of CTP group attempts to situate teachers' collaborative effort in a space where teachers come together and communicate. In other words, CTP are open-ended activities rather than pre-designed pathways

for teacher learning. Teachers' motivations and expectation coming together as a group is neither limited to designing a better teaching practice or maintaining the close relationship within the organization of teachers, nor creating a utopia where they help each other's without no institutional interfere. Through these CTP groups, teachers can not only reach agreements on how to strategically deal with the teaching task for now, but also enhance their preparedness for future teaching. However, this is not to say that there is a judgement of good/bad or superficial/meaningful for teacher collaboration groups. It is to broaden the scope of CTPs' mission from lesson co-planning, curriculum co-designing and community-building, to the long-term teacher development in a collaborative manner. The fruits from CTP groups should not only be a developed curriculum plan or revolutionized organization, but also constructively add on to individual teachers' preparedness to further incorporate these revolutions throughout their career as educators.

Learning in these CTP groups mirrors the perspective of constructivism, which suggests that individuals create their own understanding based on the interaction of what they newly acquired and what their already known/believed under in close relation with their sociocultural context (Bada and Olusegun, 2015; Hein, 1991). It also indicates that teachers, through situated teacher learning in CTP groups, individually and socially construct meaning by the sense-making about their experiences overtime. Such constructivist perspective of CTP groups rationalizes the collaboration of teachers for preparing a specific course or completing an educational task, at the same time explore teachers' learning potential in this situated teacher collaboration group in regards to 'externalizing and mobilizing' the tacit teacher knowledge (Liu, 2019) to facilitate career development for every individual teachers.

CTP is particularly significant for in-service teachers who would not like, or are not able to

dedicate big chunks of time and energy for systematic teacher development programs. In these CTP groups, the orientation shared by their peers and the mode of collaboration agreed among their group set the practical tone for their learning, whereas grant special value to this teacher enrichment process as accumulative and constructive from day-to-day teaching and discussion practices.

2.4.2 Technology focus in forms of collaborative teacher group

Despite of the efforts made by these collaborative teacher groups, insufficient in-service teacher development opportunities from the organizational level to address teachers' need to adopt innovations systematically and critically in their real-world teaching practice have been an on-going issue for in-service teachers, which makes it challenging for teachers to absorb newly developed educational technologies and innovations. Fragmented learning opportunities for in-service teachers has always been problematic in order to provide teachers with customization and continuity of learning experiences built on their already-existing experience of teaching (Darling-Hammond, 2000; Senge, 1990), and forms of collaborative teacher groups shows potentials to make up the gap. Collaborative teacher groups have been focusing on technology integration in terms of developing strategies to put the resource, curriculum, teachers, and students together and maximize learning outcomes.

Tondeur et al (2013) explore formal and informal in-service teacher learning opportunities for technology integration at the school level in three Belgium schools. Besides the given infrastructure, technical and curriculum support provided by the institution, teacher collaborative groups give significant add-ons to their preparedness of practicing technology-integrated education. They also form their own knowledge, beliefs, and attitude towards technology in a

developing manner, which allows teachers to supply a learner-centered, constructivist environment for their students. In Zorfass and Rivero (2005), well-developed teacher learning as a social approach is depicted to promote technology integration. Through CoPs, participating teachers report better understandings about students' needs, recognized potentials to inject technological elements to current teaching, and developed teaching practice with technology-integration. These gains of teachers are not directly related to some immediate tips and strategies that they can copy and paste in their current classroom, but it broadens teachers' views about various possibilities that they can start their thinking for their future teaching practices.

Although optimistic findings are presented for teachers' collaborative groups at workplace, empirical results also report that teacher collaboration does not always lead to optimistic result for technology-related teacher development. Liu (2013) investigates a teacher group in primary school setting. It is discovered that teacher community objectively exists in the school and encourages teachers to share ideas with each other, but the collaboration for continuous development is limited without systematic coordination and organized group events. Qualitative inquiry into three collaborative professional develop groups by Liu et al. (2015) also extends a contrasting result. On one hand, it is discovered that after experiencing collaborative professional learning, teachers realize that technology elements notably penetrate teachers' pedagogical and content knowledge system. It is believed that these collaborative teacher learning efforts complement the insufficient in-service training for technology integration, explore possibilities for teachers to work as each other's critical friend, and enable all teachers to acquire knowledge from each other. On the other hand, the research also identifies teachers' hesitation to engage in these collaborations due to low motivation and unwillingness to participate in observations. Technology integration seems to be lying in the gap between teacher learning and real-life

teaching practice. Teachers' uptake from collaborative teacher development opportunities differs dramatically in various research, and the expected creative technology facilitation has not been witnessed systematically among either preservice and in-service teachers. (Tondeur et al., 2017).

Debating results presented in previous research indicate that collaborative teacher group is not one-sided good or one-sided bad, heavily depending on how the groups come together and collaborate. Also, the mechanism and process of such collaborations differ from one another. From the perspective of CTP, unpacking specific teacher groups and see the meaningfulness for participating teachers would provide some insights about how the optimistic or pessimistic teacher preparation for technology integration is generated. Also important is to go beyond the researched context of specific course in specific institution at a particular time period, but also to understand the long-term impact of teachers change about technology-integrated teaching practice. This leads to my interest towards the activity in collaborative teaching preparation groups. Understanding teachers' participation in these activities as a situated teacher development attempt and their long-term outcome of teacher enrichment may provide an insight about how teacher communities impact teacher change overtime. In the next section, I explore the activity theory and its' application in teacher research in general, then approach teachers learning in their CTP groups through an activity theory perspective in order to understand the intersectionality of situated teacher learning and their longitudinal professional growth.

2.5 Activity theory and expansive learning in collaborative teacher groups

Originated from the Maxist philosophy and other Soviet scholars in the 1920s and 1930s (Kaptelinin & Nardi, 1997; McAvinia, 2016), Activity theory (AT), also known as cultural-historical activity theory (CHAT), proposes an approach to analyze activities from a cultural

historical perspective. Vygotsky (1978) and Leont'ev (1972, 1981) elaborates on the dialectic materialist view and built AT as a philosophical framework and analytical approach for understanding of human praxis as complex, situated, and developmental (Jonassen & Rohrer-Murphy, 1999). They initiate and develop variations of activity theory and contribute to further dialogue and research.

2.5.1 Generations of Activity System

The founding and development of AT has witnessed the growth of Soviet Union School of thoughts and its strong cultural historical turn of understanding human actions. The omitted philosophical ground of AT, Karl Marx, applies dialectic materialism to the analysis of capitalism by applying the concept of commodity as a contradictory unity of use value and exchange value, thus envision the bridging of dualism between facts and values, theory and practice, thoughts and activity (see Engeström et al. 1999, p. 5). A new unit of analysis explicating interactions and relationships of elements is critically needed. Embodied in Vygostsky's work, the first generation of AT perceives human actions as culturally mediated. It traces the historical influences on the present-day actions. The 'mediated act' triangle (see Figure 7) helps the examination of the internalization of a specific knowledge or skill piece. It revolutionarily emphasizes the cultural means behind each human actions as a complex "X" element between the stimulus (S) and the response (R). The object of human actions became the main unit of analysis with its cultural meaning convey when studying the subject of each action.

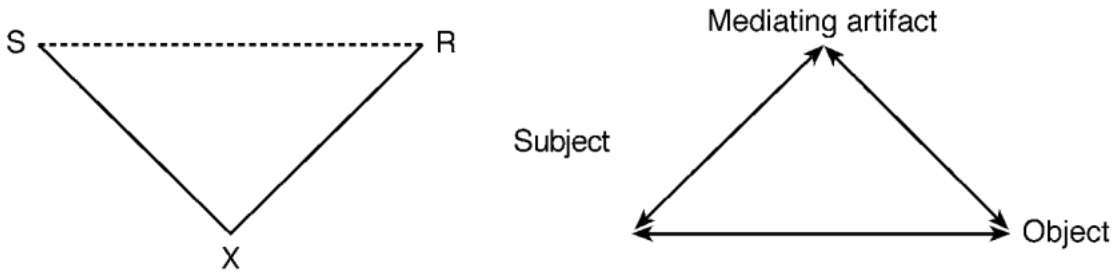

Figure 7 Vygotsky's mediated act modal and its common reformulation (Engeström 2001, p.134)

However, the early generation of activity theory individually focuses on singular action, without considering the interrelations of series of actions as a collective system. The second generation of activity theory, represented by Leont'ev (1978, 1983), shifts the unit of analysis from individual actions to *activities* in which division of labor collaborates to form a joint effort. It establishes the concept of *activity* as "evolving, complex structure of mediated and collective human agency" (Roth & Lee 2007, p,198), which shifts the "subject" of the activity from an individual level to a collective level (Engeström & Sannino, 2021). The distinguishment of individual versus collective system stems from Leont'ev (1983)'s identification of activity as a system that follows the system of relations of society. "*Activity*", following the Leont'ev conceptualization, refers to durable system where individuals serve as divisions of labor, holding different goals and taking different actions towards a collective object of a community. As the central claim of activity theory, the emerging concept of *activity* has two indications. Firstly, it recognizes the community nature of activities that are conducted by a group of practitioners. The interpretation of the *contradiction* under a specific context and the meaningfulness of an activity in relation to the community need to be depicted as the opening and the ending of activity theory research. Secondly and consequently, it excludes some actions that are discursive and individual in terms of making social or cultural contribution and negotiate contradiction in a community.

This is explicitly clarified by Engeström (2015, p.xxvii-xxix) that activity, instead of being a totality of reactions, has its structure, which is also of interest to activity investigators.

Lenot'ev (1978, 1981) has proposed enrichment of Vygostsky's triangle with the three-level scheme of activity-action-operation, and correspondingly, motive-goal-instrumental conditions, but the structure of the newly developed idea of human activity is not visualized systematically (Engeström, 1999). The graphical visualization of human activity (Figure 3) is developed in Engeström (1987, 1999, 2015).

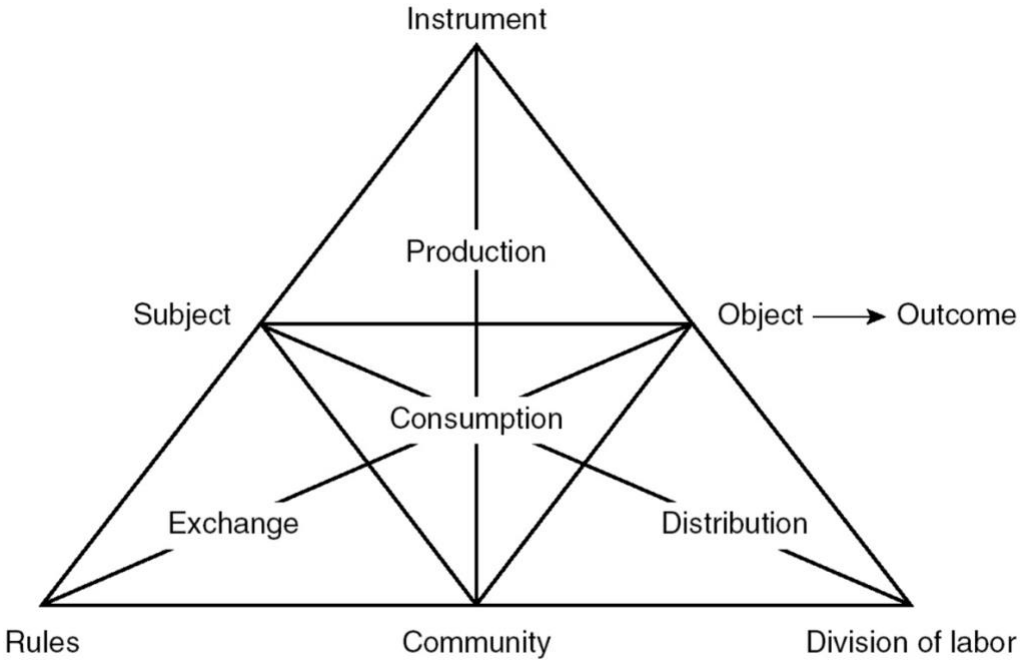

Figure 8 Structure of human activity system (Engeström, 2015, p.63)

Although such a graphic cannot avoid simplifying the nature of human activity system at a full picture, it clearly tackles the complexity of a community subject in terms of the interrelation among community members, the distribution of division of labor, and the negotiation of rules in order to achieve the object as the ultimate goal. A generalized idea of an object has its societal meaning, while a specific object is closely related to an individual and one's personal sense-making (Leont'ev, 1978). The existence and the recognition of a specific activity system mirrors

the social context in which the object is meaningful and fruitful. This inspires the identification of its object as an ambiguous entity that is both socially constructed and longitudinally developmental. An activity system thus needs to be situated in a coordinate system with the vertical axis of historical and the horizontal axis of sociocultural.

Following the established concept of activity and the structure of activity system, the third generation of AT shifts its focus from one activity system towards the interrelation of multiple activity systems that intersects with each other (Engeström & Glăveanu, 2012). Engeström develops his interest towards the network of activity systems in order to understand the social relations indicated by the shared or partially shared objects, as well as the debate and negotiation made among individuals and communities to achieve such objects. Building on that, the fourth generation of AT targets at critical societal challenges (e.g. global warming) that are aimed in a heterogenous coalition of activities with joint efforts that transcend boundaries of nations, societies, and humankind.

Starting from the second generation, the development of activity theory follows five principles, which characterizes AT in its current shape (Engeström, 2001):

1) *Activity system as basic unit of analysis.* A collective, artifact-mediated and object-oriented activity system realizes and reproduces itself by generating actions and operations. The activity system umbrellas all goal-directed individual and group actions, as well as automatic operations.
2) *Multi-voicedness of activity system*. The community nature of an activity system indicates that different positions are taken by community participants, which forms different divisions of labor. Participants' uniqueness in their personal histories and perspectives, as well as the complexity of the activity system, create multiplicity of voices and

perspectives circulation in the activity system, which can be both a source of trouble and a source of innovation, which further pushes forward the transformation in the system.

3) *Historicity*. Activity systems are historically situated with its own problems and potentials. Studying an activity system should never be decontextualized from understanding relative developmental history locally and globally.
4) *Contradiction as the core source of change and development*. Contradiction should be understood differently from problem or conflict. They reflect the historical accumulation of the tension of a structural and original tensions within or among activity systems. This can be noticed when evolvement of existing elements or integration of new elements happen. It opens up possibilities for transmission and changes overtime.
5) *Expansive possibility in activity systems.* Both individual actions and historically new forms of activities can lead to the accomplishment of expansive transformation as an reconceptualization and enrichment of existing object and motive of the activity.

As a theoretical framework, AT has a lot of potentials to research practice. It encourages insights towards activities and human actions as transformational, which embodies its dynamic nature in the cultural historical perspective and its emphasis in the changing of life conditions (Roth, 2004). Topics that are discussed under AT framework ranges from discursive individual practice to social movement that takes critical perspective towards practices of capitalism (Engeström & Sannino, 2021). Learning in practice is among one of them.

2.5.2 Activity Theory in Learning

Theorists and practitioners from different background may provide a huge variation of definitions of learning. Traditional psychology studies the mental process and the behaviors of a

learner to understand one's efforts of learning at the level of individuals. Contemporary learning theories, on the other hand, leads the paradigm shift of learning, which transcend the stimulus-response connection and the information processing procedures as individuals (Jonassen, 2002), and land learning at the level of activity system. Under this shift, approaching learning as a social activity sets the unit of analysis as a social group rather than individuals, and understand learning as a situated social activity in which individual components interact with each other and with the context (Greeno & Engeström, 2014).

Learning presents in different shapes in different lineages (Engeström, 2015). Within the lineage of learning in school going, learning activities are restricted as a receptive and reproductive effort encapsulated in school time and space, with school success as motive and school text as the object (Miettinen, 1999). The problematizing of school learning not being practical to societal practice extends the scope of learning activities to the lineage of learning at workplace, where subjects of activities are motived by a better practice of work, and learn through task accomplishing. Still being context constraint, these tasks range from mechanical routine manufacture to intellectual collaborations under the condition of a given cultural profile and market condition. Lifting the context constraint of learning at a specific time and space also encourages learning to penetrate through the objective world to "the general in nature and culture" (Engeström 2015, p.93). These lineages of learning picture the diversity of learning activities ranging from confined space and decontextualized objects to an anytime practice with social meaningfulness.

Such evolution of learning science calls for a reconceptualization of learning in terms of what counts as a learning activity, what is considered as learning object, where and when does learning happen, what the learning process looks like. It gradually shed lights on learning outside

classrooms and contextualize learning activities in a variety of social setting.

Bateson's (1972) theorization of learning proposes a logic model that necessitates the shift of learning theories by demonstrating the complexity of learning. In this model, there are five levels of learning. *Learning 0*, which refers a constant response to a given stimulus, is not always considered as learning, as it only depicts the instant reaction without arguing and reasoning. *Learning I*, which is to adjust response to a given stimulus to and specify that by correcting errors, adds a layer of sensemaking when reacting to the stimulus. This is always the ground level of analyze learning, as it contains corrections of error choices within the set of all possible responses, thus generates a stable and reasonable response as long as the context remains stable. *Learning II* , which is to understand the pattern of context of stimulus addressing (in Learning I), is always explained as 'learning to learn' (Bateson 1972, p.292). It includes context reading and information processing while making responses to the stimulus, as well as thinking about why such responses is appropriate for this specific situation but not for the other ones. *Learning III* , although regarded as rare in human beings and difficult to describe, is briefly interpreted as 'a change in how learning to learn takes place' (Pätzold 2011, p. 34). It brings social factors of learning -such as learners' characters, social relations, organizational factors and more- onto the stage. *Learning IV*, which is presumably a change of Learning III, is considered 'not occur in any adult living organism on this earth.' (Tosey 2006, p.3), and is put aside in our current discussion. The correspondence of Bateson's level of learning(level I~level III) and the Lenot'ev's activity theory (activity-action-operation scheme) is demonstrated in Engeström (2015) as seen in Figure 9. Each corner of learning activity (based on the structure of activity system, see figure 8) are unpacked with three levels. As clarified, Learning I and Learning II, those who are commonly understood as "learning", are always embedded in Learning III (always interpreted as

development) in an altered form. Bateson's leveled framework puts learning activity into layers that ranges from acquiring a fixed, decontextualized object to cultivating a more contextualized, critical, and reflective understanding towards the knowledge. Here we need to be clear that the leveled illustration of learning activity is not to distinguish one level from another. All the levels of learning exist hand-in-hand and lead to a comprehensive outcome as a learning activity conducted by individuals in the learning community.

Elements in learning activity				
Instruments	Object	Community	Rules	Division of labor
Methodology, ideology	We in the world	Societal network of activities	Societal	Societal division of labor
Models	Problem task	Collective organization	Organizational rules	Organization division of labor
Tools	Resistance	Immediate primary group	Interpersonal rules	Interpersonal division of labor

	Subject			
Activity theory	Leont'ev	Activity/motive	Action/goal	Operation/condition
Level of Learning	Bateson	Leve III	Level II	Level I

Figure 9 Leveled Corners of Learning Activity Triangle(developed from Engeström, 2015)

2.5.3 Expansive learning

The complexity and context-integratedness of these levels of learning are envisioned through activity-theoretical perspective (Jonassen 2002, p.51). In order to better illustrate learning as an activity, Engeström (2001, 2015, 2018) develop the levels of learning into a systematic manner by proposing the idea of "expansive learning". The 'expansive' here refers to the expansion of learning outcomes of a learning activity system in response to contradictions and challenges (Engeström 2016, p.8). An expansive cycle depicts the process of learning action as shown in Figure 10:

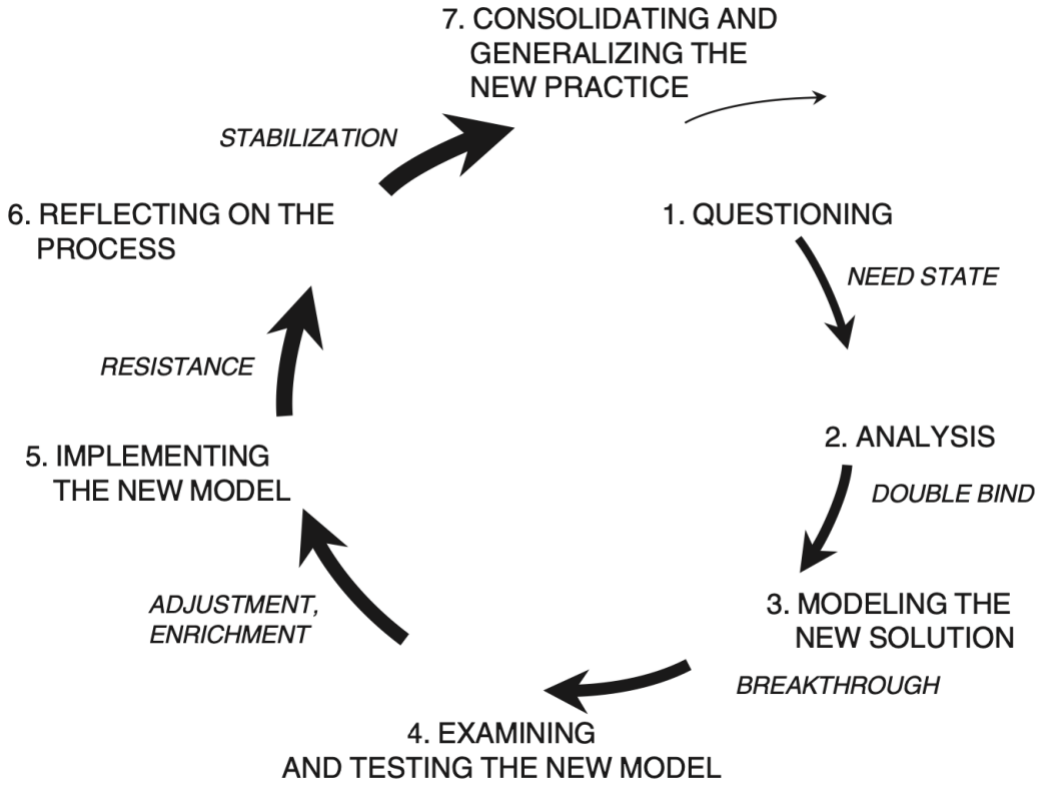

Figure 10 Cycle of Expansive learning (Engeström 2001, p.152)

The core idea of expansive learning cycle originated from the 'expansion' metaphor (Engeström & Sannino, 2010, p. 2), which indicates that learning is not only about the known, but also the unknown, and a new imagination about what is the object of learning activities, or even what is a learning activity is needed. It shifts traditional expectation of learning as "changes in the subject" towards "changes in object", which eventually leads to changes of all components in the activity system (Engeström & Sannino 2010, p.8). Expansive metaphor of learning challenges the acquisition-based and participation-based approaches by pointing out that learning is not only a process that transmits, preserves, and acquires, it also creates, explores, and expands. This is especially important in workplace learning, in which nobody know what should be learnt because of the unique nature of each work organization, work process and the social context they are accustomed to.

Expansive learning has been applied in empirical research about workplace learning, during which learning are not configured to a classroom-like settings, designed curriculums, and planned lessons. Learners in these workplace groups are not guided by standardlized goals or learning object, as the contextual differences that work/learning groups are confronted with would shape unique learning trajectories accordingly. Instead, learning happens exploratorily and constructively when members of the workplace community form their collective activity system that are specific to their own shared object(s), and develop transformative practices. For instance, expansive learning are used in medical education research to investigate boundary break-down process and co-production of practical medical knowledge that are generated for real-life clinical environment (Burton & Hope, 2018). It specifically helps documenting medical students and patients' collaborative efforts to develop transformative expertise to be co-responsive for the medical future (Engeström, 2018; Engeström & Pyörälä, 2020). In teacher education research, expansive learning can also applied to understand how intervention can support the development of transformative agency fostering systematic changes of teacher thinking and practice. Rather than immediate, specific changes in content delivery and pedagogical practice of specific lessons, these are more frequently lands generally on educators' cultural sensitivity responsiveness, sense-making of working experiences, and the co-production of learning outcome through innovative design (Chang, 2021; Ivaldi & Scaratti, 2020; Kaup, 2020)

2.6 Summary

The literature above depicts the on-going trend of technology-integration in the field of education, especially language teaching, being a critical element in teachers' PR&A decision. Researchers have extended and redeemed their interests towards teachers' attempts developing

both their practical capacity and mindset in relation to the technological turn. They mostly land their emphasis on teachers' thinking, belief, and knowledge constructs around what contextualized decisions they made about fixing their course, or specific pedagogical practice decisions. This, as synthesized in Burns *et al*. (2015), traces back to the generations of ontology in teacher cognition research, ranging from individualistic to social and sociohistorical, whereas the most recent trend, recognized after the 2010s, adopts complex ontology, which embraces the social turn, recognizes the importance of context, and draw importance on day-to-day practice. Empirical teacher cognition development research with a technology-related focus have focused on one-dimensional studies, predominantly conceptualizing technology as a tool to supplement teaching rather than considering it as a contextual element and a underlining condition of their professional life (also see Attia, 2011; Chen, 2008; Harris et al., 2009). They most investigated how technology has been applied in teaching practice instead of it being an influential factor that changes the norm of language education format, curriculum plan and course design, or the language itself as a social and cultural representative.

CTP groups and the activities conducted in forms of teacher communities are the arena for teachers' individual, cognitive development to be socialized. Like those around technology integration, research pieces on forms of teacher collaboration are also challenged in terms of focusing on the effectiveness of their activities to achieve the expected outcome of teaching that is pre-designed with insufficient consideration about their responsiveness of on-going evolvement of contextual elements, including their institutional and social surroundings as well as the everchanging nature of the language being taught. These activities could be conceptualized with more long-term meaningfulness instead of being regarded as a trouble-shooting action on the go.

In order to better understand teachers' journey towards incorporating meaningful technology integration, more comprehensive discussion could be carried on through personal enrichment as well as group co-development perspectives to triangulate the learning trajectories of teachers. With teaching during pandemic as background, the investigation of this current study conceptualizes technology integration as a social, cultural, and historical context that urges radical change. The obligation of going technology-intensive considers little about the level of preparedness of curriculum, institution, and teachers, which potentially challenges teachers to actively engage and navigate themselves when pushed out of their comfort zones. Language educators, especially the ones that are currently in the field, are in critical needs to establish, and constantly renew their cognition about technology integration and its transformative effects of their thinking, reasoning, and decision making in realistic environment. Teachers' accessibility to teacher community for collaborative teaching preparation as well as their reflection after interacting with students may provide them with first-hand resource to achieve such transformation towards technology intensive teaching. Studying in-service teachers learning to smoothly realize this transformation from the complexity of individual and social perspective would better address technology influence towards language teaching profession. This complexity of "the individual and the social" as well as "the practical and the cognitive" have inspired the conceptual framework that intersects both as a coordinate system, which will be proposed in the next chapter.

3 Conceptual Framework

Focus of the research questions lands on the complexity of technology integration and its contextualization in making educational decisions shifting in-person language classroom to

online. Modifications of the language course, from changing the overall course structure to adjusting day-to-day pedagogical practice, reflects these language instructors' response to the emergent situation of online shift while keeping the ongoing goal of the existing curriculum as teaching professionals. Both collaborative efforts of the instructional team and individual development as professionals should be taken into consideration. Accordingly, the conceptual framework of this study is composed as a coordinate system.

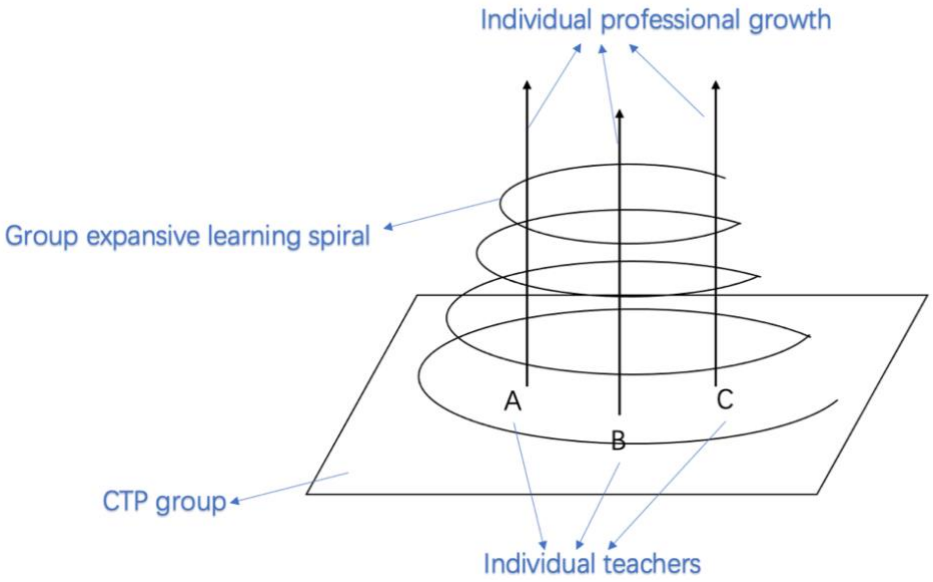

Figure 11 Visualization of the framework

The horizontal surface represents teachers' CTP activity as group efforts to face the challenge of technology-based teaching, to update their curriculum and course materials, and to make appropriate pedagogical decision to responsively consolidate their teaching. The vertical axis, on the other hand, is to understand teachers' individual cognitive development in relation to technology integration during their participation in the collaborative activity. I will brief the established framework of both axis, and explain how they intersects in the current study.

3.1 The Horizontal: Expansive Learning Activity of a teacher community

By framing teachers' collaborative teaching preparation as expansive learning activity, I adopt the structure of activity system (see Figure 8 in Section 2.5.1) to understand how expansive in-service teacher learning evolves socially. This framework positions language instructors into the social network of their CTP group, in which they engage in series of social actions. It enables the understanding of CTP group activities by unpacking it into multiple actions, both explicit and tacit ones, which are made by the division of labor to achieve the object following the rules and regulations, and inspired by the motivation and the contextual elements at social, organizational, and individual level.

To analyze the learning activities, the Eight-step-model that has firstly been brought up in Mwanza (2001) has been incorporated. As an analytical model that evaluates learning activities, it provides dimensions for analyzing key features of working practices as learning activities by asking open-ended questions to each component of the activity theory triangle (see Figure 12).

Activity theory triangle components	Questions to help define key features of the activity(ies)	Questions addressed in the researched context
Activity of analysis	What sort of activity is being analyzed?	Teaches' collaborative teaching preparation activities
Object or objective of activity	What is the purpose of the activity?	To prepare for technology integrated Chinese language teaching both for their specific semester and being more technologically competent as teaching professionals
Subject in this activity	Who is involved in the activity?	Language instructors and the researcher formed the CTP group, which is studied in this research
Tools mediating the activity	By what means are the subjects carrying out the	Collaborative teaching preparation meetings; everyday work generated

	activity(ies)?	through the meeting; learning moments from the meeting and the related everyday work
Rules and regulations mediating the activity	What are the cultural and institutional norms, rules or regulations that governs the activity(ies) being performed?	As a language educator being consistent about teaching and ethical appropriateness; as a part of specific Chinese language program in a higher education institution; as an active and responsible member of the CTP group; as a participant of the current social reality of technology explosion, as well as the global pandemic that initiated the emergency online shift
Division of labor mediating the activity	What are the roles in the activity(ies) and how are they organized?	CTP team member; technology specialist; leading discussant of specific topic (rotates among members)
Community in which activity is conducted	What is the environment where the activity(ies) is/are carried out?	Language instructors come together as a team with complex goals of co-teaching, professional learning and community/friendship building
Outcome expected	What are the desired outcomes from carrying out the activity(ies)?	Teacher changes in response to the social, institutional, and cultural context, being prepared not only for current school year, but also for their career-long enrichment

Figure 12 Identification of key feature in Activity System (Adapted from Mwanza 2001)

In the figure presents the eight answers for questions that one may ask to identify the composition of the activity theory triangle contextualized in the specific study. It's initial application in the current research is to identify the features of the CTP group and the general activity of collaboration in teaching preparation, and with all the answers to questions the activity triangle is constructed as seen in Figure 13. The focus of societal learning and

community learning rationalizes activity theory as a comprehensive framework to investigate collaborative teaching preparation. AT helps understanding how actors (here the studied group of Chinese language educators) in a collective system forms a dynamic that transforms the actions, operations and sub-activities into an outcome (Karakus, 2014).

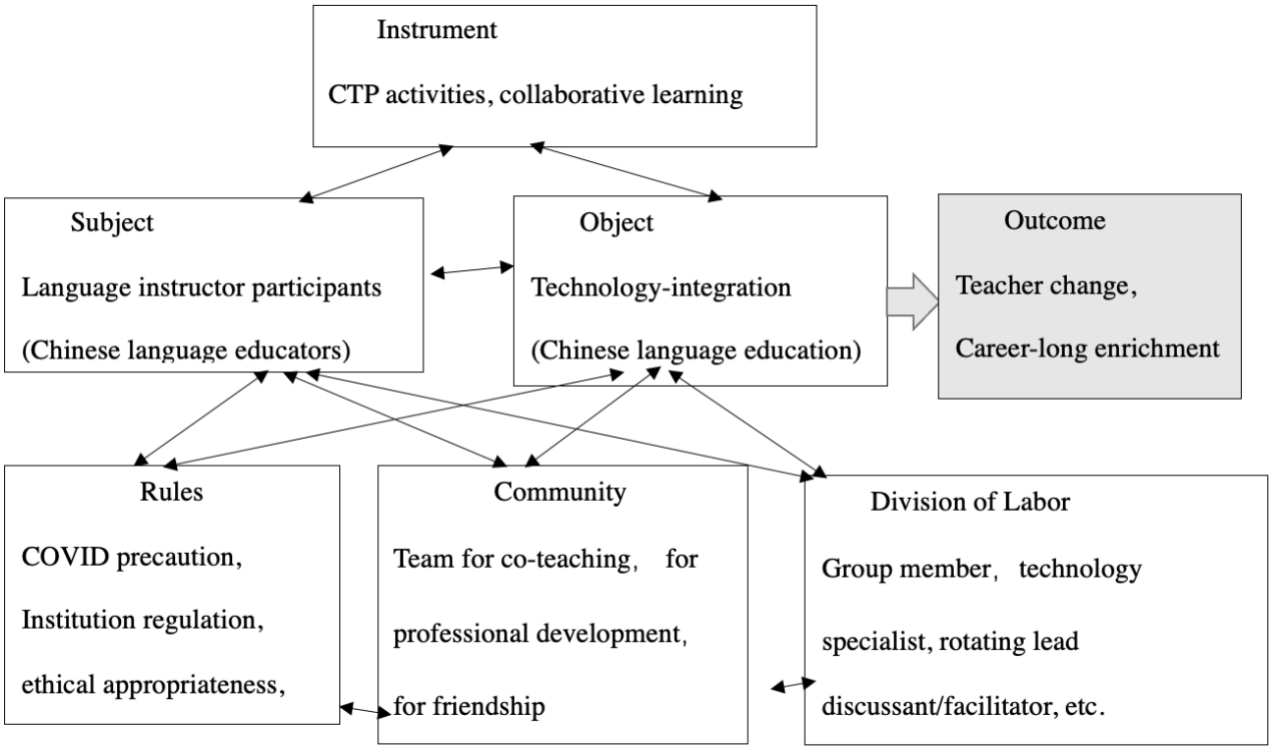

Figure 13 Activity System of the collaborative teaching preparation

Unpacking the CTP group activities in the activity theory framework assures that teachers' expansive learning is applicable in their daily collaborative activities. The spiral in the visualization above indicates that instead of a set cycle of expansive learning, CTP activity(ies) take place overtime and wound its way up. The utilization of expansive learning as conceptual framework to study their workplace learning about technology-integrated language teaching within collaborative teacher group is also based on the following rationalizations. Firstly, these language instructors collaboratively work in a CTP group in which members are closely bound and inevitably connected because they share similar working context and teach students of a

similar kind. These instructors share significant similarities in their teaching, which could be same content knowledge, similar course type, or a same group of students, essentially making them have enough space to collaborate on. Secondly, the activity being analyzed is simultaneously teaching preparation and learning. In this CTP group, all participating individuals share motive of conducting effective online teaching and develop successful language educators. Decision-makings on curriculum changes, lesson redesign, material preparation, pedagogical reasoning, and assessment re-arranging all require teachers' collective efforts of observation, consideration, and negotiation, and reflection in order to teach successfully. CTP group members consequently share the object of constructing a successful language course for their student group as well as developing themselves as more competent teachers. Thirdly, in this CTP group, members manage to keep up with their roles and tasks although they have individual interests and critical thoughts about the work they commit to, or language teaching in general. The group dynamic is steady and consistent, and they hold their commitment towards the group work rather than escaping from it to be individualistic.

As shown in the visualization, individual language instructors' professional growth trajectories are embedded in the group activity of CTP. They call for a developmental perspective understanding participating instructors about the changes of what they know and how they think. This as the vertical axis of the coordinate system is specified in the next section.

3.2 The Vertical: A developmental perspective of teacher cognition on technology integration

Being a member of the CTP group, individual teachers' evolving object and efforts of their collaborative work during the virtual school year indicates teacher cognition in relation to

technology integration could be fundamentally changed overtime. I take a development perspective to understand changes of language teacher cognition towards technology integration that may (or may not) take place during the school year. Cognitive development processes of teachers--especially when facing to challenges from the society, the institution, their classrooms, and in this study COVID-19 and emergency online teaching shift—could be fuzzy, especially considering the multiple elements of technology-related teacher cognition construct (see Section 2.3.2). The aim of this study is not to draw a fixed correlation among these aspects and the constructed teacher cognition. Instead, explaining how these aspects interact to route teacher cognition development. Documenting the aware-awakening processes of recognizing the challenges of technology integration, changes in their cognitive processes and the sense-making about the problem-solving strategies under the specific context, as well as encouraging evolvement of cognitive disposition regarding technology integration are goals for the vertical axis inquiry.

Inspired by the teacher cognition framework and the influence of technology integration, this study focuses on the following three aspects when discussing language instructors' cognitive development of technology integration. Firstly, professional growth related to technology-integrated language education. It combines the accumulated professional knowledge with technology being a major component following the T-PACK framework, as well as the digital competency of educators during classroom practice and generally in their professional life. Secondly, teacher belief of technology integration being a critical element in contemporary language education. It looks into teachers' mindset about whether or not technology integration has been accepted as a positive change of contemporary language education, and to what extend those innovative efforts incorporating technology into the language course are welcomed in

future attempts of course preparation and teaching practice. Thirdly, instructors' reflective thoughts about their experience realizing technology integration in the language course they worked on. Both pains and gains are critical points of consideration, since they complement each other when portraying the real-life condition how teaching a technology integrated course would shift teachers' lives, especially considering all contextual elements which could be influential during this process.

3.3 The intersection of the two axes

As CTP group members, all instructors teaching the Chinese language course share the social learning process while individually experiencing personalized trajectories of development overtime, and they influence the trajectories of each other. Unpacking their collaboration as an activity system describes the working and learning mechanism of the team and explains the collectivistic workplace effort of facing to and dealing with the challenges brought by technology-integrated teaching. This problem-solving process, as an activity that facilitates individual language instructors' professional growth, could witness teachers' cognition development as individuals. At the same time, teachers' individual developments shape their scopes participating in the group activity, which fundamentally influences the activity system of expansive learning during CTP activities. It needs clarifying that neither the group exploration process nor professional growth as individuals should be neat, independent, or mono-directional. The statements above serve as the inspirations for the visualization of conceptual framework shown in Figure 11. In the visual, the studied Chinese language educators are signified as dots in the horizontal surface, which indicates that individual instructors are forming the activity group and building the community for collaborative work. Meanwhile, these dots lead to their own

horizontal axis that signify their individual professional growth. The spiral is specifically used to signify the non-linear growing paths of the group activity, including collaborative course planning and the exploration of technology-related professional skills along the trajectories of individual professional development. As the expansive learning cycle as a theoretical framework was presented as a step-by-step circle (as shown in Figure 10 in section 2.5.3), it is also open for revision whether modifications would be necessary to describe the paths of learning in CTP. Intersections of the social and the individual land on the instructors, who are they major subject of the research. Conceptualization of teaching preparation work is based on these two axes--forming the teaching professional group effort with their unique social properties, these Chinese language instructors' synchronic exploration of technology integration when collaboratively conduct a specific language course during the COVID-infected school year would also be considered as a milestone in their personal longitudinal growth as university language instructors.

Based on the stated conceptual framework, an intersected combo of methodology is applied to answer the research questions about the two-dimensional exploration of teacher collaboration and teaching development. This will be detailed in the next chapter.

4 Methodology

With the expectation of understanding Chinese language educators' collaborative work during shifting to technology-intensive teaching as well as its implication for their professional growth, I apply a qualitative case study to inquire the situated interactions conducted among the CTP group, and its perceived impact on Chinese language instructors' professionalism. Focusing on the empirical data and the realistic perspectives, case study, as stated in Yin (2017) provides

opportunities for researchers to take critical consideration about the studied cases that represent the research topic within their specific contexts, and to deeply understand the evolving situation instead of a segmentary slice of the entire constructive architecture. Two approaches, ethnomethodology and narrative inquiry, complement each other to comprehensively understand teachers' enrichment from a social perspective and their self-reflexive perspectives respectively.

4.1 Ethnomethodology

Ethnomethodology (EM) is proposed as a distinct approach for sociological inquiries firstly by (Garfinkel (1967). He evolves the way sociological inquiries from fact-oriented field to an activity-oriented—moving from agreeing on structured social facts that constraint the social actions to exploring the production of social facts through everyday practices. EM finds its origin in the "theoretical conception of social phenomena" (Coulon, 1995, p.2), and extends its use to analyze ordinary actions in daily life and understand the underlying logic. EM aims at explicating the social constitutions originated from the social activities taking place discursively (Have, 2004). These, from an ethnomethodological perspective, are contextualized in an intelligible organization that the actors construct (Maynard & Clayman, 1991). Exemplifying the significance of Garfinkel's sociological theory, ethnomethodological perspectives is founded on the interest towards how the social facts practiced by the social interactants in specific context can be elicited from the activities throughout their everyday life.

EM is considered as beyond a methodology or a theory. It serves as a perspective that umbrellas the theorization, documentation, and reflection in order to accomplish the organization (Whittle, 2018). EM finds its philosophical roots in phenomenology (Heritage, 2013; Psathas, 1968), and demonstrates its phenomenological sensibility by keeping the loyalty of the existence

of the object(Schutz, 1972), while understanding those as people constructed. It demonstrates its social perspective by interpreting mundane actions as constructing the social reality, liberates the contextualized practices as primary constitution of the society, and attaches social meaningfulness to these practices. EM research show interests towards the correlation between social settings and human's contextualized practice is explicated by analyzing the 'realities'(Mehan & Wood, 2010)– the social construct that generates and contains human activities, and cultivates manner of how these activities are conducted. EM invests in empirical fieldworks that inductively studies the raw realities that are produced by people and examine the everyday methods of people's sense-making. The activity of talk and the organizational feature of the situated contexts are both important. This gives an insight that the units of analysis should include not only the features of interactions but also the relation of these activities and the rationale to concatenate them in the given setting (Atkinson, 1988). According to the three EM's key principles for social inquiry (Sormani, 2020), EM research analyzes primary phenomenon in participants' situated practices (rather than their verbal formulation) that are procedurally and descriptively demonstrated and interpreted by the researcher(s). Instead of aligning with the objective reality, EM digs into descriptive details which relies on researchers' honest explication of what has been noticed throughout these practices. It also breaks the boundaries of existing theoretical categories, which indicates the accountability of observations made through raw everyday activities instead of theory-underlined interpretation of their socialized meaningfulness.

In a nutshell, EM are interested in the rules (e.g. Cicourel, 1974) and the methods (e.g. Garfinkel, 1967) that runs the social activities and the underlining social order (Gallant and Kleonman, 1983), thus introduces a descriptive approach to articulate its display in the situated practice of social members. Such social order is considered as tacit yet witnessable (Sormani,

2020), which invites researchers' focus on the observable elements of these social interactions. With specific interests towards situated practice and production of social order, EM is developed with several strands that empirically informs relevant research. These serves as analytic tools to accomplish the EM research. Koschmann (2018) summarizes the four analytical traditions, namely conversation analysis (CA), multimodal CA, context analysis, and interaction analysis (IA), as approaches to understand the documented social interaction. IA umbrellas the other three approaches, as it is comprehensive enough to include the observation of linguistic units applied interaction (CA), the multimodal elements that accompanies the linguistic features with bodily and environmental features (such as gestures, facial expression, and body languages) (multimodal CA), and the contextual features that regulates the interaction (context analysis). All the units of analysis cannot be decontextualized and isolated with the social feature evident in the raw observation.

Sharing the ethnomethodological feature of adopting bottom-up approach to explain the social order, CA has been regarded as one of the most influential form of ethnomethodological research that focuses on natural language used in conducting social interaction (Maynard and Clayman, 1991). A lot of methodological and empirical studies regard EM and CA within one set of methodological approach that draws attention on naturalistic data generated in everyday practices instead of lab experiment data (e.g. Forrester, 2010; Lynch, 2002; Reeves et al., 2017; Watson, 1992). Both EM and CA investigate the joint efforts of social participants to communicate with each other naturally in all types of social interactions. Also noticeable in these studies is that documented language-in-use during social activities has been developed from linguistic units to multimodal language, and to more comprehensive entity of interactions. Following these steps is the enrichment of CA to multimodal CA and interaction analysis. This

indicates that rather than paying attention to the decontextualized linguistic patterns of the used language, the ultimate reason why ethnomethodologists pay special attention to language is to document and understand what mundane practices, let it be linguistic or action, have composed the social understanding as it is realistically.

Ethnomethodological approach draws on researchers' sense-making to interpret the observed practice of social members. Researchers actively take steps to document and analyze these practices. Three methodological steps of ethnomethodology are proposed in Francis & Hester (2004, p.25-26):

1) Notice something that is observably-the-case about some talk, activity or setting.

2) Pose the question 'How is it that this observable feature has been produced such that it is recognizable for what it is?'

3) Consider, analyze and describe the methods used in the production and recognition of the observable feature.

Ethnomethodology applied in teaching and learning research has been prominent. This, as rationalized in Heap (1984), is because the invisibility of learning. Learning can only be manifested and displayed publicly through activities and organization so that it can be observed and studied. Ethnomethodology thus finds its significance in research conducted in formal learning settings (such as STEM education, reading classes, music education, and medical education) (Abrahamson et al., 2019; Ghaffari-Rafi et al., 2020; Heap, 1990; Ingram, 2018; Jungwirth, 1996; Markee, 1994; Roulston, 2001) as well as informal learning settings (such as museums, workshops, and other workplace learning) (Faimon & Zimmerman, 2021; Franco & Greiffenhagen, 2018; Gibson et al., 2021; Meisner, 2007; Newton et al., 2015; Styhre, 2006). To answer the question of "What is going on" in these learning spaces, EM provokes an honest

attitude towards the situated interactions which never happen in vain. Ethnomethodological approach is particularly meaningful for research exploratory efforts that are made in response to radical changes and/or unexpected circumstances, as these are more likely to stand out from the routine and have their specific meaningfulness to inform future practice.

To study a collaborative group of teachers, identifying the ways of interaction and documenting the practice made by interactants are the primary steps to investigate how individual teachers conduct learning by socialize themselves in the group. This relies on the honest documentation of "what is going on", which shows respect to the reality and while considers the specified features of the context. It also requires researchers' reflexivity about the interactive nature in those specific settings. This resonates with my goal of the study of collecting the everyday practices of participants' CTP attempts and understanding those from a teacher learning perspective, and sparking teacher reflection/awareness about how their workplace attempts stimulate their professional development. This, as well as being an attempt to understand teachers' group work, is also meaningful for investigating participants' uptakes from these activities, which may give an insight from the participants' perspectives on how they make sense of these processes and how they learn from those. This brings in narrative inquiry as an approach to understand individual teachers' perceptions of the social activities and their own routes for enrichment along their life trajectories.

4.2 Narrative Inquiry

Narrative inquiry stands out as a qualitative research methodology that "begins with the biographical aspect of C. Wright Mills' famous trilogy—biography, history, and society" (Chase 2011, p.421). In other words, narrative inquiry is interested in how one's personal information,

experiences and connection with different social groups are crafted as stories and then told. The three-dimensional narrative inquiry space—interaction, continuity and situation (Clandinen & Connelly, 2000; Clandinin, 2006)—explains how the narratives are relationally composed by both the narrator and the inquirer. As a qualitative research methodology, narrative inquiry shows interests in how one's personal information, experiences and connections with social groups are crafted as stories and then told. What narrative inquiries work on is both the insight of one's lived experience and how one approach such experiences through the storytelling (Clandinin and Caine, 2008). On one hand, the stories provide life histories information, at the same time demonstrate the developmental tendencies of one's selfhood, meaning-making process, and value system (Goodson & Gills, 2001). Participants, through their storytelling, highlights the life stories that they regard as relevant, explains how they make sense of their experiences, and profoundly implicates the fluidity of self-identities and beliefs of one's own. On the other hand, it is also unfolded in the stories that participants structure and configure their lives in a particular way. The stories that participants retroactively tell sit in the perspectives of 'now', which mirrors the perspectives they have accumulated from their experiences.

As opposed to objectivity, what narrative inquiry works on is the uniqueness of the discursive stories. The narratives are relationally composed by the narrator and the inquirer (Clandinin and Connelly, 2000 ; Clandinin, 2006). The descriptive nature allows, even celebrates the unexpectedness of how things developed and how it is described, which are situational and cannot be represented by one-cut statements. For those who are living in related contexts and resonate with these stories, the predictive value of the inquiry relies on their own interpretation about how their own experiences connects with the storytelling represented. The interrelation of the participant, the researcher, the presentation of the stories, and the readership of the inquiry all

have impact on the ways in which these individual narratives compose the genealogies of context (Goodson & Sikes, 2001).

In educational studies, eliciting narratives of teachers is important, one crucial being narratives are also efficient tools for teacher development. Storytelling as a pedagogy is developed in the process of narrative inquiry (Coulter *et al*, 2007). Stories, which are also called 'oral history', serve as the medium to illustrate and transmit culture, values, beliefs and philosophy, provide opportunities of both mainstream and less-represented narratives to be heard. Frequently applied in pre-service teacher education programs, storytelling encourages student teachers to face themselves as a self-reflexive learner and to raise awareness of their own learning experiences (Tendero, 2006). It also potentially builds connection with those who share similar narratives and upon their willingness, build a collaborative space to share and learn from each other (Shank, 2006). For teaching professionals, recalling life and educational experiences as a narrator provides a precious opportunity to sit down and review what one experienced, what real-time reaction was made, what has been learnt and how has everything developed. These may also inspire researchers, fellow teachers, and teacher educators, to reflect on each other's own history of being educated or educating the others.

4.3 Crossover of EM and NI

The combination of EM and NI research serves the goal of understanding the intersection of the horizontal and the vertical stated in the conceptual framework. EM can be considered as synchronic and matches the horizontal, as it requires documentation of an epitome of specific activities. In the context of Chinese language instructors' CTP activities as workplace learning

attempts, EM has led the researcher to approach the activity of CTP meetings and instructors collaborative work practiced day by day, aiming at understanding what have been the objects of their activities, and how have they managed to achieve those step by step.

On the other way around, NI can be considered as diachronic. It takes a developmental perspective and trace the development of individuals overtime, with its crucial step being verbalizing participants' thinking and lessons learnt out of recent activities. It provides space for one's reflexivity about what achievement and disappointment has been realized, as well as their awareness of personal growth. Through inviting participants to narrate their CTP practices during the studied school year and reflect on their experiences, NI in the study of Chinese language instructors' professional growth approaches the cognitive development of individual participants as an outcome of participating in collaborative activities, and discovers their perceived changes that are meaningful for their profession.

As stated in section 1.4, the researcher's role in the CTP group is both a researcher and a critical friend, which indicates that the researcher would take a passively participatory observer of their collaborative activities. This requires the researcher to be engaged at a distance, making sure everything is in a good pace while not overly interfering their decisions and teaching preparation. This facilitates the researcher's attempt to develop a comfortably distant relationship with the researched CTP group members—everyone participating in the CTP naturally grow consensus towards the group efforts of teaching preparation which helped the interpretation of their everyday social interactions in the group, while holding one step back to leave space for participants interaction and to deliberately be critical about their decision-making

and action plans. It also facilitates researchers' "1.5th person"[2] perspective investigating individual teachers' professional growth, as the researcher partically participates in their leaning so that an interactive reflection process can be generated through story-telling in NI. Inspired by the conceptual and methodological consideration of the studying Chinese language instructors' CTP and relevant professional growth, detailed research design is made and demonstrated in the next chapter.

5 Research design

5.1 Setting

This research was conducted during the school year when COVID-19 response required full online modality for all courses in a comprehensive university in Midwest, US. Studied language instructors were assigned to teach an intermediate level 4-credit course of "Second Year Chinese" in the three-year-long Chinese language program based in Department of Asian Language and Culture. This course had been in the program for long, and it used to be taught in-person with a faculty leading instructor and a group of teaching assistants. During the studied school year, the course was taught by a fixed instructional team, both Fall and Spring semester. COVID-19 hit the university during the semester before the studied school year, and the university had followed the public health advice to run the school year virtually, meaning the Second Year Chinese course was scheduled online. While facing COVID challenges of changing course modality, this course still fulfills its core mission of bridging registered Chinese language learners from beginner level (criteria of First Year Chinese course) to advanced level (criteria of

[2] Here I use the term of 1.5th person to illustrate the in-between position in the middle of first person and second person.

Third Year Chinese course) based on their ongoing curriculum requirement. There are two institutional context information indicated above: For one thing, the majority of the Chinese language learners registered for this course were likely to be continue students from First Year Chinese course (or have equivalent language proficiency from previous language learning experience based on placement test), which meant they should have developed a language learning habit before testing out the new course modality and all innovative ideas of the instructional team. For another, after the research period of one academic year, these students were expected to meet the criteria to start Third Year Chinese course, meaning they have the same amount of target content knowledge to accomplish as previously in-person course regardless of modality changes. This set the context for the teacher group to navigate—innovative teaching for a pre-existing goal in a specific institutional context.

What's more, COVID-19 enforced social distance, making all the language course instructors work from home for the entire school year. They consequently have very little to no access to physical teaching/learning materials including textbooks, workbooks, and some other supplemental materials that used to be available in the department building. They also were not able to share an office space daily and talk with each other as easily as they used to, so they started a plan of meeting weekly through virtual meeting platform and discuss about their teaching.

5.2 Participants

The researched instructor group consisted of three graduate student language instructors led by a graduate student lecturer, who was more experienced language instructor, and two graduate teaching assistants. All of them were Chinese doctoral students studying Chinese literature

and/or linguistics. They are all originally from China and relocated in the US to attend graduate school. At the time of research, they were within the age range of 25-35. Details about the participants will be further inquired through interviews.

During the studied school year of Fall 2020 Spring 2021, this instructional team taught in Second Year Chinese course in the Chinese language program mentioned above. Students in their classroom are predominately white undergraduate students in the university. The instructional team considered none of their students with a generic background affiliated with China/Chinese, while some of them were Korean/Japanese.

5.3 Data collection

The chart below illustrates the data collection procedure designed for two-semester online instruction. Data collection consisted of three components throughout the academic year:

Semester	Month (1-week buffer)	Video collection for meetings	Interviews	Teaching material & artifacts
Fall 2020	Month 1	✓	✓	✓
	Month 2	✓		
	Month 3	✓	✓	✓
	Month4	✓		
Winter break			✓	
Spring 2021	Month 1	✓		
	Month 2	✓		✓
	Month 3	✓	✓	
	Month 4	✓		✓
Summer			✓	

Figure 14 Research plan for two-semester online instruction

5.3.1 Teacher meetings: video recording and note-taking

Teacher meetings, regarded as a crucial component of the collaborative teaching preparation

efforts, were held on every Friday afternoon if there was no last-minute emergency or time conflict. This time slot was agreed by all participants at the convenience of concluding the past week and planning for the coming week. Being invited as a critical friend for their technology-integration by participating in their weekly meetings, the researcher was authorized to file the videos of their weekly meetings and take field notes. Special attentions were paid to topics discussed in the meeting, the procedure of the meetings, agreements or disputes among the instructors, and any moments when the researcher opted in to provide some comment and ideas.

The video files and field notes were collected to document discursive practices made by the CTP group member so that tracing back the sequence of practice that these instructors took to navigate through the challenge of technology-intensive teaching became possible. This fulfilled the requirement of ethnomethodology research to 'take seriously the implication of the routine observability of social activities' (Francis & Hester, 2004, p.24) value mundane practices and discursive moments of collision and fusion of critical thoughts, thus help understanding practitioners' knowledge and competence to accomplish the 'activity under investigation'(Francis & Hester 2004, p.27)--in this case—technology-integrated teaching. These provide first-hand data to answer the RQ1 about the activity taking place during their collaboration.

Additionally, the researcher kept weekly self-reflexive journals after sitting in CTP meetings and participating in instructional team's collaborative work. These journals included researcher's perceptions about contribution or uptake of each participating instructor in the meeting, documentation of the negotiation and problem-solving moments among participants, critical thoughts about the significance of discussed technology-related elements in their teaching, potentials for further improvement of their technology-related teaching, and any other interesting

details that were worth paying attention to. These journals complemented the field notes document and provided a reflexive perspective about what was discussed, how the discussions went, and what did the discussions mean. They also provided resource from a researcher perspective to triangulate the teacher participants perspective about the meetings.

5.3.2 Interviews

Besides the documentation of teacher meetings, interviews were also conducted. Key purposes of the interviews were 1) to triangulate the observed information collected from the instructors' CTP meetings, 2) to understand the reflection of participating instructors' development of ICT competence and technology-related profession, and 3) to trace the evolvement of teacher beliefs about technology integration. Five interviews are planned throughout the academic year. The format of each interview is co-designed by the researchers and the participants. Topics covered in the interviews includes teachers' belief about technology-integrated teaching and learning, teachers' self-evaluation and perceived development of technology competence, experiences, and reflections about the collaborative teaching preparation. Schedule and protocol of the interview is in the Appendix.

5.3.3 Teaching artifacts collection

Participants were invited to share the teaching artifacts they prepared for teaching online, especially those they mentioned during the interview. Mentioning specific teaching artifacts indicated the significance of those pieces as representatives of their teaching preparation and teacher learning. For example, if one of the instructors mentioned a new application they used for interactive teaching, it could be important to understand what was newly added into their

teaching practice, what new skill/knowledge was required from the instructor(s) to conduct teaching with such innovation, and what are their perceptions about the meaningfulness of incorporating that. This will help clarify the ways in which developed technology-related knowledge and beliefs are practically integrated in their teaching practice.

5.3.4 Potential amendment for in-person instruction

While the course taught by participants was held online in Fall, it was still unclear if the Spring semester would be run in the same way until the middle of Fall semester. Initially the research plan remained fully only, but in case Spring semester would be conducted in-person and participants would return to work and meet in their physical office, the researcher was open to a potential amendment of doing all the meeting observations and interviews on-site with recording. Also, less technology-related component would be expected from their meetings and personal reflections. However, this would also open up the possibilities of instructors carrying their professional gains from an online semester back to in-person mode of instruction. This was proposed in the research plan to keep both researcher and participants aware of the potential amendments, as well as to remain flexible about both the research and their teaching preparation strategy in response to the course modality.

5.4 Data analysis

As stated above, data collected from the research includes the videos of the meetings, field notes and reflections of the meetings, narratives from the interviews and some teaching materials to supplement the understanding of the meeting content as well as the narratives. Analysis of collected data was done from both individual growth perspective and group collaboration

perspective, featuring both equally. These two aspects happen together, and they fundamentally influence each other through both alignments and disputes. Two major approaches of data analysis, video analysis and narrative analysis, are applied to process the these collected data (see Figure 4). In this section I brief introduce why and how these two approaches work.

RQ #	Analysis Method	Sub-Analysis	Data Source
1	Video analysis	Conversation analysis	Meeting recordings (audio)
		Discourse Analysis	Meeting recordings (video+audio)
			Self-reflexive journals & field notes
2	Narrative analysis	Artifact Analysis	Teaching materials collected from teachers
		Thematic, interactional, performative analysis	Individual interviews: transcripts
			Field Notes

Figure 15 Data analysis

5.4.1 Video analysis: focusing on the activities of teacher collaboration.

As detailed in the Methodology chapter, application of ethnomethodology method is informed by Goffmanian interactionalism (Attewell, 1974) in terms of dynamically construct the ever-changing social discourse, with conversations and interactions as typical units for analysis (Macbeth 2007). Studying the language in conversations offers EM research insight about detailed features of both sociological and organizational rules for participation (Hester and Eglin, 1997) and the sequential turn-taking programed in the specific context (Sacks *et al,* 1978). The audiovisual data adds an additional layer beyond verbal language to understand the situated

participation of practitioners.

To answer my first research question, I refer to the iterative process (see figure 5) presented in Knobluauch and Tuma (2011) to manage the collected data. I will explain how my proposed research incorporate this video analysis process (using the example of 'Discussing the weekly dubbing activity').

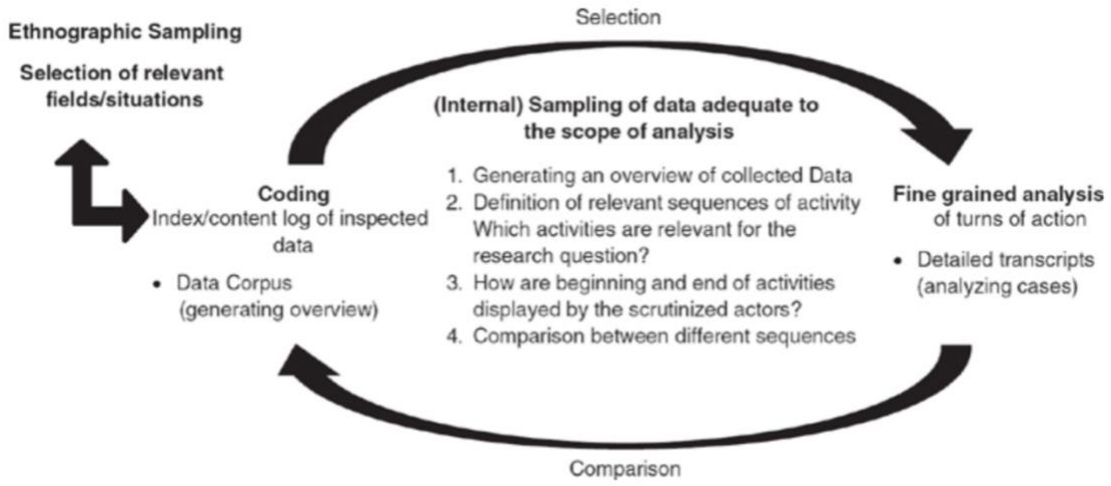

Figure 16 Process of Video analysis (Knobluauch and Tuma 2011, p.419)

The relevant sequences are any discussion or negotiations that are made for a technologically shifted Chinese language teaching efforts. Transcription of the relevant activities and the visual of these activities will be coded for analysis. Coding and analysis of the conversation and the visual will afford the researcher to understand micro elements of (1)what topics/aspects of technology-integration are discussed (e.g. Creating voice-over exercise for the dialogues in the textbook using Arctime Pro and iMovie), (2)what problems do they come across (e.g. How to use the software; which part of the textbook dialogue is suitable for this exercise; how to design a manageable activity and instruct that to students), and (3) how their turn taking and actions taken—including language, gesture, reactions—help to exchange ideas and to conclude the topic (e.g. Technology specialist introduces the software in a training section, group

members make a demo, group leader test the demo before uploading for students, etc.). Comparison of different sequences may identify the series of discussion that is relevant to the same topic and discussed in several meetings (e.g. How to use the software to make a voice-over material -Week 1;how to simplify the caption and accurately upload it onto the video timeline – Week 2; What complaints do teachers receive, and if they should provide more time for students to record the response-Week4; What deduction is needed to shorten the dialogue and control to length - Week4;).

Discourse analysis (included as a sub-analysis category because it provides contextual information about the activities analyzed in video analysis) supplements the analysis of the situated activity in the teacher meeting and zooms out to understand the situated context (see figure 6).

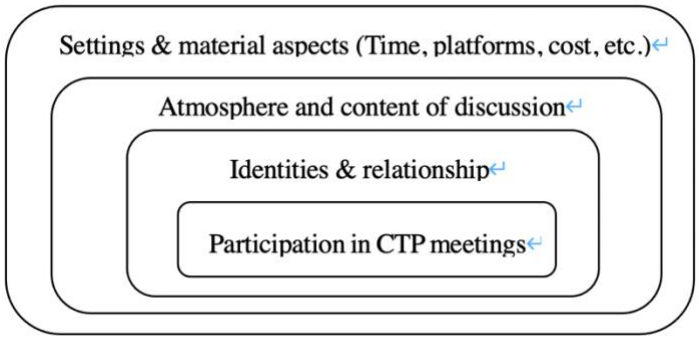

Figure 17 Framework of discourse analysis (adapted from Dahlgren et al. 2006, p.81)

Field notes and researcher's journal can provide insights about how interactions flows (e.g. Leading instructor took the lead of conducting voice-over exercise, planed a workshop section to introduce the softwares used to compose the material, and persuaded the instructional team to dedicate extra effort on it), how the atmosphere of the discussion maintains (e.g. Some of the instructors showed hesitation of learning the new software, discussed back and forth and agreed on producing a demo before actually use it), and what other information can the researcher as an

observer/technology specialist sense from the activities (e.g. Faculty did not put up strict restrictions for those revolutionary activities to be practiced; All participating instructors accept the voice-over activity as a norm of a weekly Speaking exercise eventually).

5.4.2 Narrative analysis

Besides analyzing activities observed in their weekly meeting rooms, inquiring into the narratives allows researchers to understand participants' sense-making of the situated practice. To answer my second research question, the narratives of the participating teachers as a reflection of the teacher collaboration activity indicate the constructive nature of teacher enrichment.

Informed by Riessman's (2013) four-model typology of narrative analysis, this research applies a combination of *thematic analysis* and *performative analysis*. The mechanism of analysis is explained below (using the example of analyzing interview on collaborative lesson preparation done through google drive).

Thematic analysis will be conducted to locate life history information from participants' narratives, and provide participants' perceived information about their experiences in the activities (e.g. One group member is happy that she is not alone in lesson preparation as a first-time teacher, but anxious about leading one of the lesson plans as a novice teacher; She has format issue using google doc; She ignores the compliments and the positive feedbacks about her material preparation, only expressing frustration when receiving complaints of the group leader about the imperfection, etc). Especially important to inquire about is the connections between their previous experiences and their practice at this moment (e.g. Being a former literature major graduate student and teaching assistant, one participant was used to the individualistic approach of planning a lesson, and had zero experience generating any lesson plans in a language course;

A participant felt delightful for the stress-relieving nature of having a team at the back when doing collaborative lesson planning; Having not been in a co-editing situation, some participants did not anticipate issues about the others editing their documents and get those messed up). As they are participating in the same meeting activities, it is also particularly interesting to see the different narratives they generated for the same activity (e.g. Experienced instructor expressed her satisfaction about the first-timer's lesson plan job while first-time teaching was frustrated; Talking about co-editing on google slides, some argued that despite some minor messed-up situations, doing it through this online platform has many advantages, while the others were suspicious about such form of collaboration). Performative analysis aims at understanding participants' attitudes and emotions deeply embedded in their narratives and some un-mentioned elements that are implicitly conveyed in the interviews (e.g. Experienced instructor softened her voice when discussing about the disputes happening in the meeting to show her compassion about the stress for a first-timer; Experienced teacher particularly and repeatedly emphasizes the benefit of co-planning by presenting the folder of previous lesson plans and indicating that this is a valuable product of their collaboration, meaning she is proud of this work mode and see this as a good tradition she established in her team).

Narrative analysis triangulates the observed information from the researchers' perspective with the participants' perceptions. It also makes diachronic connections between the real-time activities and overtime teacher development by understanding how teachers make sense of their teacher learning experiences, and how they perceive their take-aways from their CTP. In this way, the two axes of understanding the CTP activities could be both explored.

These two types of analysis intersect with each other as approaches to understand both the synchronic and diachronic development of teachers' collaborative work and professional growth.

They help depicting the picture of studied teachers' attempts both conducting meaningful Chinese language teaching during the global pandemic and self-improving being language instructors. Chapter 6 and 7 demonstrates the data collected throughout the school year and analyzed through the coordinate system as conceptual framework.

5.5 Limitations

Admittedly, the nature of this designed qualitative, longitudinal study has its limitations despite of its meaningfulness:

Firstly, the study is based on a large-sized public university with a dedicated Asian language and culture studies program. Their Chinese language program has its specialties that can be hard to generalize in others. In comparison with other private institutions or liberal arts universities (Y. Li et al., 2014), the size of their Chinese language program is significantly bigger and requires comparatively more instructors, whose titles range from professor, lecturer, student lecturer, and teaching assistant. The studied language instructors have seldom worked alone to prepare and teach a course. The fact that the studied teachers have a team at their back cannot be taken for granted, as it could be a rare situation for some other Chinese language instructors working in smaller sized programs to have co-instructors or teammates to prepare for the course together. On the other hand, a bigger language program always means it is more comprehensively designed and less flexible, which put more restriction and less freedom on teachers' attempts to rearrange or modify their courses. The contextual element of how these teachers came together as a group would not be easily generalizable for the other teachers or instructional teams.

Secondly, the study focuses on the case of one collaborative teaching preparation group with

three instructors, which could contribute a relatively small sample size. Participating instructors have their personal characteristics that are unique based on their educational, academic and working histories. Although individual teachers in this group covered the range from novice to expert in terms of teaching experiences, to claim that with all the uniqueness, the study can speak for the overall situation of Chinese language instructors working for all kinds of Chinese language programs in US universities is simply unrealistic. It is undeniable that the selected case of CTP group takes place in one small group with only three instructors and one researcher may not help depict the common feature of collaborative teacher groups across different institutional and cultural context. But the uniqueness of the researched CTP provides clues for the unique features of how individual teachers socialize and interact in the situated activities, then internalize their experiences for career enrichment. The expected findings are very contextualized and would not be generalizable to explain the bigger picture of during-COVID technology use and language instructors' technology-related professional develop. Rather, the appropriate goal of this study is considered to be telling the story of this specific group of language instructors whose experience could be critically borrowed by others.

Thirdly, the study has included limited direct information (observed or recorded) about how the studied instructors practice in their classrooms. Researcher made this decision of not including classroom observation based on a discussion made before the research started between the researcher and the lead lecturer about having observer in the classroom and the impact to teachers and students. Final research plan of not including classroom observation was made based on the consideration that teachers' preparation and technology-related competence could hardly be represented in a single section, and it is less reasonable to unstablize the flow of regular classroom than to explore teachers' perception and teachers thinking about their

technology-related profession through interviews. It is acknowledged that the ultimate goal of teacher learning should be improved practice in the classrooms, yet the evaluation of teachers' performance in technology integration is not something that can be done by the researcher individually, nor was this the aim of this specific research. The researcher being invited by the lead instructor to observe each instructor's class and provide some critical advice before the mid-way interview, however, was considered as helpful by the instructional team, and provided some themes of discussions for mid-way interview based on details in their classroom teaching observed by the researcher. The observation also provided the researcher some insight about how studied instructors behaved in classroom practice.

6 CTP Group Activities and Technology Integration Discussed

In this section, descriptive data about what have been discussed about technology integration during their CTP group activities is presented. Aspects of technology impacts in their specific Chinese language course have been categorized and have become the outcome of CTP as the activity to practice technology integration.

6.1 CTP as a collaborative activity

Three language instructors who taught in the same course came together as a teacher community in the same form as instructors teaching a same course would normally do in their program. They all agreed that it is "absolutely necessary"[3] to collaboratively prepare for their

[3] Both the observed teacher meeting and the interviews done with the teachers are translingual between Chinese and English. Participants have been encouraged to use the language they feel comfortable at the moment. Utterances sampled and quoted in the double quotation mark can be either the exact word said by the participants or the direct translation of what they said.

teaching because they would like to be able to check in with each other, discuss the achievements and problems they have had in time. This served their community goal of successfully teaching the course throughout the school year. Here, what they meant by "collaboratively prepare" is not merely sitting together, freely talk about thoughts and inspire each other. They were truly preparing for a same set of course material, activity design, lesson plan, and more—they essentially expected a ready-to-use package from the preparation that would allow them to parallel their teaching with each other. This has been highly encouraged among the instructors teaching in their Chinese language program. Throughout the studied online school year when all teaching and teaching preparation work were accomplished remotely, although their efforts of group preparation were not only dedicated to technology-related topics, technology-integrated teaching still stands in the center of their discussion, as it was the contextual feature of their day-to-day teaching practice, and was underlining behind most of the moves they made. Major appraoch of their collaboration included a weekly meeting scheduled on every Friday afternoon, and their daily communication chat group. The daily communication chat group was created among all the CTP group members through their most frequently used chatting mobile application when they contacted each other. The CTP group agreed that the chat group was a time-efficient tool to quickly catch up on each other's daily work, make some quick updates, and share some minor details among each other. It was also considered as a community building tool to connect all members of the group and construct the atmosphere of sharing and caring. Important discussions outcomes that were reached in the group chat would be brought up again in the weekly meetings, as the group chat was still considered as an informal space rather than the official notice board for their collaboration. On the other hand, the weekly meetings of the CTP group were considered more "official" or "formal". Group members dedicated at least 40

minutes weekly to participate in the group meeting on Friday afternoons. The group meetings were hosted on the platforms they were using for their synchronous discussion sections during that week. This helped teachers to familiarize themselves with the platform, and also allowed them to use the CTP group meeting space as a sandbox to try out platform-related settings, test operations, and trouble-shoot potential issues that may occur in their virtual classrooms.

Studied teacher team agreed during their first weekly meeting that technology-intensive curriculum design make it possible to incorporate flipped classroom as their directive approach. The notion of flipped classroom (Bergmann & Sams, 2012), firstly brought up by J Laoshi before the online school year started, was the theme of their online course design transformation. The CTP team reached the consensus that their takes of the flipped classroom idea would stand on the perspective of using the core classroom space as a place to conduct interaction among teachers and students and practice target language. Its expectation of class time being practice and production time has urged instructors to not only get ready for the communicative discussion sections, but also strategically facilitate students' language content learning in the pre-learning period before discussion starts—this was not what instructors in their Chinese language program used to do. Teachers' collaborative teaching preparation was held to accomplish such object and the outcome. Below are some more key features that explains the teacher meeting as the crucial segment of CTP group activity:

6.1.1 Configuration of the teacher community

As explained in the research design, members of the CTP group were three co-instructors of a University Chinese language course and one researcher/critical friend/technology specialist. All instructors were PhD students majoring in Chinese, but they had different levels of linguistic,

pedagogical, cultural, and technological specialties when it came to teaching the specific grade in the Chinese language program. Among them, J Laoshi was the leading instructor who specialized in Chinese applied linguistics and had abundant previous teaching experiences, so she took the role of pedagogical specialist in the group. She also took the responsibility for all the group decisions made throughout the school year. Her role was especially critical considering the institutional factor that this teacher group was consist of all graduate students (faculty supervisor is not a direct member of their teaching team). As a result, J Laoshi and this instructional team could have more power and freedom to make curriculum decisions. In fact, they consider themselves lucky enough to have a supportive faculty supervisor who encouraged them to teach critically and creatively. This, as J Laoshi argued in Interview1, could be helpful for them to put some of their hypothetical thoughts into trials and daily practice.

Y Laoshi and L Laoshi, as member of the community, were less experienced as J Laoshi, the leader, and were not fully confident with their applied linguistic and language pedagogical knowledge by the time the CTP group was firstly founded. But they were open-minded towards learning , and were willing to contribute more on everyday tasks such as grading, perfecting details for class design, keeping tracking on students, and preparing digital materials for the class. They also contributed some out-of-limit innovative ideas for the lesson design and material preparation as they might not be restrained by previous standards and were able to think out of the box.

In terms of technology integration practice, the group had the researcher as a technology specialist with previous experiences facilitating remote language course and producing multimedia contents for various purpose. The researcher was also a professional language instructor with teaching experiences, thus was sometimes invited by the instructors as a critical

friend to sit in their classrooms and provide critical thoughts about the course and their teaching at times. Under the circumstances of online school year, all CTP group members expressed their willingness to dedicate time and energy exploring technology-related methods of teaching, and they were prepared to face the challenge learning and applying new technology.

6.1.2 Routine of Weekly meetings

Each weekly teacher meeting started with greetings and small talk that enabled members of the CTP group to catch up with each other about their work and life. No specific topic was regularly brought up, but some of their frequent topic included school affairs, their academic/graduate student life, the COVID-19 situation around the globe, and even gossips in their personal lives. This, especially in the time when community members did not meet in-person, generated friendship and personal connections among them, and made them feel a sense of belonging instead of indifference among each other.

The small talk segment was always followed by a check-up of students' status and other relevant house-keeping information of the course. For instance, the on-going COVID-19 situation made students' health and well-being as a major component of student care, and the online shift of most (if not all) university courses urged students and teachers to get used to a more flexible schedule with possibilities of changes and rearrangements. CTP group members kept each other updated about information such as students who needed accommodation on assignments and exams due to health or schedule issues, sections that were struggling with participation in interactive activities through online platform, and/or institutional information from the department and the university. This not only included their direct observation for class-related issues, but also include discussion and reflection about the institutional and social

circumstances, which served as critical contextual elements of their course planning.

Often the next step was the discussion about the standardizable tasks such as grading, class material scanning for student access, and canvas platform management. Tasks were routinized in detail after the first teaching preparation cycle so that after experiencing they could be distributed among CTP group members clearly. Following this was the discussion section planning, which included some or all of the following segments: content knowledge clarification, material preparation discussion, feedback of class observation, and practical teaching tips. As the most experienced teacher, J Laoshi was more likely to take the lead, while Y Laoshi and L Laoshi always provided supplemental or creative thoughts about ways to understand the course content, as well as how to effectively present the content to students. As a critical friend of the teaching team, the researcher was sometimes invited to share thoughts about how to teach a specific language point in the meeting although she was not a part of the instructional team.

What happened the next would be the wrap-up clarification of weekly plan and task distribution. They discussed and confirmed the priority of the tasks to be done, made sure everyone understood the task list of the group and themselves, and clarified when each task should be accomplished.

Beyond the routine, the group collaboratively worked on the additional tasks and challenges that they are confronted with as needed, which was mentioned by J Laoshi as “见招拆招” (Chinese phrase, meaning dealing with the issue as it shows up flexibly). These, although not in the regular routine of weekly meetings, were also critically important as the challenge of an online course could never be all predictable and these were considered key moments for the teacher group to realize, solve, and reflect on the situation they were facing, thus improved their competence of teaching technologically and conduct better teaching practice for the current

course. As mentioned above, some of these topics extended off-meeting to the group chat in which they did quick check-up with each other about their progress, and confirmed random details during their daily work. These are detailed in the next section.

6.1.3 Themes discussed during weekly meetings

Under the general object of shifting traditional classroom to a technology-intensive, contextualized, and communicative version, teachers' weekly discussions targeted at the good, the bad and the challenges about specific teaching practice during those days. Teaching effectively through flipped classroom approach being a general object of their CTP group activity, their collaborative work could be merged into several topics/themes. By reviewing the transcripts of meetings and coding researcher's field notes, several common themes emerged overtime, which could be considered sub-objects of the CTP activity:

a. Course set up for the online-only mode of instruction

Intensive discussion around this topic took place at the beginning of both fall and spring semester when the CTP group worked together to compose the course syllabus, teaching plan and other details of the course set up. J Laoshi specifically mentioned it at the beginning of the online school year that their instructional team had to work without a faculty head instructor, which could be a good chance to break through the limitation of the traditions and execute creative trials of new design. Flipped classroom was proposed as the core idea of their course planning, which required the teachers to consider changes and challenges that it could bring to the teaching and learning process, especially when teaching in virtual classrooms, a modality that neither students nor teachers were familiar with. All details, from general planning of how the lecture and discussion sections should run to details of when the after-class activities should due,

were subject to change. Members in the instructional team were aware that decisions around how to set up their course should be carefully done, as they might not have chance to revise their semester plan once it got published and visible to the students. This could be a challenge for most of their upcoming decisions throughout the school year.

b. Planning and use of digital platform(s)

During the online school year, the instructional team intuitively chose Canvas, a platform that was officially used by the university, to distribute digital course materials as well as instructional information how to complete learning step by step. Canvas had been widely used in the University as a complementary tool of teaching and learning before the pandemic, thus easily became the platform that instructors and students were both familiar with. Rather than choosing what platform to use, discussions during the CTP group meetings were more targeting at how to appropriately use the features offered on Canvas platform. It was once considered "the go-to place" if any communication was needed about any coursework—if not differently specified.

A software specifically for their virtual class meetings was also crucial for the group. Video conference softwares that were supported by the University included BBC Ultra, Zoom, and Webex. The CTP group discussed about their choice of software and its features as a class meeting platform. They also explored other platforms that they might base their class activities on if needed.

c. Redesign of off-class course activities and tasks

As mentioned above, though the learning outcome of the school year were not expected to be modified significantly in order to keep consistent with the overall curriculum for all Chinese language courses in the Department, flipped classroom set the tone of radical change of approaches for teaching and learning. Off-class learning was of particular importance, through

which students were expected to accomplish pre-learning and reviewing tasks. Activities in pre-learning stage played the role of knowledge input, demonstrating the language points as learning objects clearly, efficiently, and creatively. This guaranteed that students knew the language to be used in discussion sections *before* they come to class, and practice during synchronous sections could go smoothly and effectively. At the other end of the language learning process, activities in reviewing stage should consolidate students' learning *after* they finish practicing the language they learnt interactively. Students were expected to actively participate in both forms of off-class activities, which were critical for learning under the flipped classroom approach during the time of the online schoolyear. Technology expanded the possibilities and modalities for students to practice and utilize the learnt language even though they didn't the common space of classrooms, and such benefit could only be redeemed if the off-class activities were nicely planned and designed. What's more, the online school year limited students social time as they could not physically get together and interact with each other, which reduced small talk time, after-class talk time, and other opportunities for them to communicate using the language they learnt. Wisely design off-class activities could be teachers' attempts to boost students' after-class interaction. All these aspects indicated the significance of off-class activities redesign, and made it a regular theme of discussion during CTP meetings.

d. Revision of in-class pedagogy to teach online

Technological turn being a contextual element of all teaching and learning efforts, most of the previous in-class practices were facing revisions as well. To name a few, physical interactions among teachers and students could be limited, so students might feel themselves less engaged, or lack direct sense of the language. Teachers also needed to carry out a different set of technology-friendly learning activities for students to remotely participate while truly feel engaged. Details

of these modified pedagogical decisions were heavily contextualized based on what resource was available, who the learners were, what specific learning outcomes they expected, and what technology-integrated approaches they felt comfortable to incorporate in teaching and learning.

Getting the instructed language points into communicative practice was the key of in-class learning in flipped classroom approach. Synchronous classrooms hosted in-class activities and teachers' pedagogical attempts to keep the interaction flow and make it more meaningful. In weekly meetings teachers come together, discuss and reflect on how the class activities were going, and what could they do to make those work better.

e. Digital course material preparation

Although Canvas had been used as course resource center before pandemic, this school year was the first time when they truly needed to rely on digitally created and exchanged course materials. This included textbooks, workbooks, exercise books, additional hand-outs and materials that may be printed out for in-person instruction, and some other content that were not previously needed in the traditional learning modality. This not only meant teachers needed to disseminate those virtually, but also required them to make it possible for students to get their work done digitally and receive adequate feedback. Besides these, course materials must also supplement creative curriculum design and lesson plan, and fulfill the requirement of their "flipped classroom" blueprint.

Two types of material revision were observed as objects of the CTP group course preparation—firstly, the digitalization of existing segments of the course. This included but were not limited to: making digital versions of textbook, transferring previous physical workbooks to online versions, making PowerPoints for synchronous discussion sections, providing recorded version of grammar lectures instead of doing in-person PowerPoint based presentation, and

making assessment materials virtual-friendly; Secondly, also observed was the innovation of effective and creative technology integration. This referred to the course material that were not needed previously but became supportive materials for newly developed course/activity design.

To familiarize the instructional team with the practice of online language teaching, generally applicable digitalization skills were introduced to the instructional team during teacher learning workshops offered by the institution, while skills of applying contextualized, innovative techniques were mostly brought up during peer-led information sections and self-directed learning. Beyond these dedicated professional leearning section, further understandings about how to utilize technology wisely in language teaching practice were testified and reflected during practice.

f. Planning for the technology-friendly assessment and evaluation

Previously in their traditional course planning, assessment and learning evaluation relied on students' class participation, weekly paper-based quizzes, homework, and tests that included reading, writing, listening, and speaking sections. The teacher group were on the mission of inevitable adjustments and revisions of some segments in traditional assessment model. For example, concerns kept circulating about traditional format and mid-term and final exams accommodated through honor lock (the virtual test tool used by the university). Teachers in the CTP group, after being informed by the department about relevant issue and complaints, agreed that it might not be the ideal choice to transplant the traditional assessment into honor lock[4]. Students also may not participate in the synchronous section in a way they used to do in in-person discussion sections, so they might need to reconsider and justify their new criteria of

[4] In interview 2 and interview 3, all of the participants mentioned that the university was experiencing issues on the honorlock system because it failed to recognize faces of people of color for "lighting reasons" and was reported unfavorable by students who potentially suffered from mental health issues.

evaluating students' participation and positivity in learning. Planning for the assessment and evaluation is based on not only their awareness of the curriculum requirement with technology integration at the beginning of the school year, but also their realization of the need to make adjustments overtime while the contextual situation was evolving at the same time.

g. Workload management and selfcare for both teachers and students

Meanwhile, it was important to understand that the contextual situation of COVID-19 was way more complicated than simply requiring schools and institutions to move previously in-person classes online. Its profound impacts—about how the society operated, how institutions ran, how interactions were conducted within and among communities, and how individuals made sense of them all—comprehensively composed challenges that students and teachers were facing while running their lives and work/study under social distancing circumstance. Beyond all the adjustments they planned for the course itself, teachers also needed to take into consideration that students could be involved in critical situations and needed additional accommodations, supports, or simply care and love, thus be sensitive and responsive to those. At the same time, teachers themselves were likely to be under similar if not more pressure keeping their work and life manageable due to the evolving situation of the pandemic and other contextual components.

With all these adjustments and modification of the previously developed course in need to be done, teachers could easily be at the position of overwork, voluntarily or inevitably, still cannot feeling confident enough to handle the unsettling situation. Teacher meetings were the essential place where teachers got connected and had a space and opportunity to share their thoughts, feelings, achievement, or frustrations, thus let them get through this challenging time as a team rather than being alone. Topics around workload and self-care in the teacher meetings were brought up to make sure the arrangement of the course could allow all teachers and students to

maintain a healthy work cycle and stay positive.

6.2 Technology turns within expansive learning cycles

The seven themes that detailed above did not appear as one-time topics for teacher meetings. Instead, they were constantly brought up in discussions throughout the school year. Starting from recognizing the contradiction between the carrying-out of technology-based teaching under the specific circumstances and the features of traditional teaching approaches that they were used to, teachers in the CTP group collaboratively developed their insight in these topics and learning through discussion, practice, and reflection. Expansive learning about conducting online technology-intensive language teaching has been facilitated through instructor-oriented exploring in the direction of these seven aspects that are inevitably intertwined. This section seeks to align the process of collaborative teaching preparation during the online school year with expansive learning cycle to illustrate teachers' exploration of how to facilitate learning in a technology-integrated, online language course. Seven expansive learning cycles descriptively explains teachers' collaborative learning in relation to the seven themes, and the connections among them are also identified to construct these seven compartments into a comprehensive learning activity.

6.2.1 General course set-up

As a piece of background information, due to the COVID-19 pandemic situation, the online shift of the language courses in the Department of Asian Language and Culture started at March 2020, the second half of the spring semester before the studied online school year. It was an emergency shift in which teachers were expecting a normal in-person semester when planning the course, hence were not fully ready for online teaching. The department expected language

instructors to keep their in-person course set-up – each academic week should consist of one lecture, four discussion sections, off-class study time, and homework tasks—to fulfill the language course credit requirement. In the studied instruction team, J Laoshi was the only one teaching a language course during that half of spring semester, and she started planning the upcoming online school year by recalling her experience during the previous half semester about what emergency preparation her old team managed to make and what could be done better. In both *Interview 1* and the *first pre-semester teacher meeting*, J Laoshi described how the sudden take-over of online mode of instruction from a traditional language classroom failed to consider the objective differences how two modalities of language classrooms were designed for. For example, she believed that online lectures were less prepared since instructors did not make deliberate decision whether lectures were to be given synchronously or asynchronously. Also, it was mentioned that specialties of Chinese language learning required some "featured elements" in the course design. For instance, as a pictographic language, 汉字（written Chinese characters）were the fundamental unit of Chinese language learning. Previously in-person instruction made tasks such as dictation and workbook characters writing more straightforward so that students would be comfortable reading and writing those characters. The emergent response of the instructional team struggled to propose effective alternatives for their handwriting tasks and activities, both in-class and as graded assignments, which would facilitate students' character learning process. Although these reflections were neither fully intentional nor systematic enough, they still provided the studied CTP group a good starting point by predicting the challenges and filtering some inappropriate solutions before coming up with innovative ideas to discuss about. In particular, it helped with the questioning and analysis of difficulties running the online courses in the same configuration they had traditionally. For example, J Laoshi

brought up that based on her observation, the previous in-person configuration of 18-20 students per discussion section applied in the virtual classroom would limit students' opportunities to be fully engaged in classroom interaction. She also provided the insight she gained from peer teachers' experience during 2020 summer programs that their trial—splitting the discussion group to two, running two half-sized, half-length discussion sections (in their specific program, 9-10 students instead of 18-20 students, 25 minutes length instead of 50 minutes)—did not meet their expectation because the 25-minute sections were too short to accommodate the core content if warm-up and wrap-up segments were both done comfortably. Also, her observation during the spring half-semester emergency suggested that large-size synchronous lectures were hard to run in an online mode, and would not receive satisfying learning results. Students simply tried to fake their participation tasks for participation grades, let it be a multiple-choice questions series or comprehension check short answer questions, without actually attending lectures. As a result, students were not familiarized with the lecture content enough, or did not fully absorb the new language patterns they were expected to learn and get ready for practice. The following small group discussion section had to make up the knowledge delivery that was supposed to be accomplished in lectures first, then squeeze in some drillings and other activities that were not extended enough to lead to the mastery of their learning objects.

The new trial of course planning via flipped classroom approach, initially brought up by J Laoshi, received high expectation from the department and faculty members. The general idea, as commonly understood by all the three teachers, was to make synchronous discussion sections as an opportunity to generate interactions among students and teachers around the learning objects of the week. This gave birth to a new course plan of "pre-learning+practice" mode. In this course design, student finish their pre-learning segments in advance, then go to synchronous

discussion sections. Students, with the guidance of course materials and activities available on course Canvas site, were expected to pre-learn the knowledge of the week before participating in the practice during discussion sections. This attached great importance to the pre-learning phase, meaning that students must actively engage in pre-learning before meeting with teachers and classmates. Conducting pre-learning of any kind had not been a formed custom in this Chinese language program--it was mentioned in the early CTP group meeting before Fall semester that although pre-learning had been considered as quite important by language instructors even before this semester, it was seldom been practiced among their program before. Thus, it was believed that the pre-learning segment could be a major potential challenge for the instructional team to facilitate.

The instructional team chose to shift the weekly lectures into a full asynchronous version as a component of pre-learning. Led by the general idea of flipped classroom, lecture became a crucial component of their pre-learning process in which students were expected to familiarize themselves with the language points and other knowledges that textbook and other supplement materials offered through the presentation by leading instructor. Choosing to do lectures asynchronously not only provided the instructional team more opportunities to organize and carefully prepare for the presentation and other self-study materials, but also allowed students to conduct learning at their own convenience and preferred pace, with unlimited chances to go back and revisit the materials as needed. The instructional team also identified a potential concern from experience shared by the previous instructors during summer programs that lectures being recorded might seldom be watched by students. In response, activities and assessments were planned to complement the recorded lectures to ensure students could make good use of the lecture videos and other pre-learning materials. Students were expected to dedicate

approximately 5 hours for all the planned pre-learning activities (including attending asynchronous lectures), which is around 1.5 hours more than in-person lecture time according to the CTP group's projection. Consequently, the discussion section time would be reduced while still fulfilling the total weekly class time requirement of a language course. Adjustments of synchronous discussion sections from four times per week to three made it possible for a partial class size change. The instructional team believed that instructors could accommodate 20 people in review sections where comparatively less interactions were expected to take place. For the rest of the week, each instructor would be able to host 10-person sections instead of 20-person ones by having each student come to the meetings less but gain more teachers' attention. With the possibility of an adjusted weekly plan, J Laoshi initiated the proposal of each student attending two 10-person sections(Monday/Wednesday or Tuesday/Thursday) and one 20-person Friday review/wrap-up section every academic week. Meanwhile, the instructional team was aware that the revised discussion section plan might cause a shifted weekly schedule for students who registered for the course already. A survey that calculate students' availability/preference for synchronous discussion section meetings was also designed. This would help the CTP group to arrange the sections, and if possible, balance the sections in terms of students' level of proficiency and make pedagogical plans accordingly. Based on their rough calculation, all the instructors believed under such course setting students were expected to participate in asynchronous grammar and vocabulary learning plus three synchronous discussion sections every week, and the work load for instructors remained leading one discussion section per day plus off-class preparation work (this included pre-learning course material preparation, communication to students, grading, and other irregular tasks such as attending department meetings and professional development workshops), which was "presumably handlable" *(J*

Laoshi and L Laoshi, CTP meeting Sep 2nd).

This course set-up got approved by the faculty supervisor and the department as the initial model of solution for a full online school year of their own course. Their blueprint of the new model featured the flipped classroom elements of self-learning most of the contents and group-learning how to communicate with others with the content from self-learning engaged, which indicated that the activities taking place in class were meant to be for review and practice. This led to the second characteristics of this model, which was teachers rotate teaching. The aim of rotate teaching, as illustrated by J Laoshi in CTP meeting and interviews, was to let students experience communicating with a variety of Chinese speakers, and also have something new to expect each week. Among the instructional team, upon making sure each instructor's availability, they agreed on allocating themselves into all three sections throughout each semester. Each student would have all three instructors facilitating his/her section and making interaction individually. Instructional team considered one module from the textbook as a cycle of learning, thus made sure that each instructor stayed with a same student group for full cycles before rotation so that the flow of pre-learning to review would not be disturbed. Rotation happened after one or two cycles and try to make the sections refreshing with changing facilitators as new people to talk to. Researcher brought up challenges of rotate teaching to the instructional team at the beginning of the school year, the concern being the students may just get accustomed to one instructor before a new instructor came, and students will have to familiarize themselves with instructors again and again. J Laoshi defended for the team by emphasizing that the meaning of discussion sections would no longer be instructors teach and students listen. Alternatively, students finished learning by themselves and come to discussion sections to find interlocutors to talk with, which meant that it is totally fine if the students were not fully familiar with the

“leading interlocutor”. In other words, rotate teaching design not only tried to connect students with more teachers to build a more holistic community, but also encouraged students to experience diversity on ways of communication. Also as they knew every instructors in the team, students could comfortably shift sections if anything emergency happened and they could not make their specific discussion section time occasionally, which provided flexibility of schedule if they truly needed it.

Despite of all the perspective validity of their new course set-up, examining of the new model would not be considered accomplished before it was examined during practice and received reports and reflections students, peers, and themselves. It is a shared point of view of the CTP group that having half-size discussion sections made activity arrangement and execution more practical and handleable. This part of the model was duplicated in the second half of the school year. Teachers also remained their flexibility rotating across the section to diversify the in-class interaction and practices. Meanwhile, some remodeling is in urgent need after teachers examined the new model by putting it into practice and receiving feedbacks. The major one is related to the asynchronous learning. In the teacher meetings of the first semester, one of the constant issues brought up by all the CTP groupnmembers was students’ unpreparedness for practicing activities in synchronous sections, because their newly learned grammar and vocabularies in asynchronous segments of the course were not solid enough. The instructional team noticed it from the frustration of not being able to execute the class activities smoothly, and seek for innovative ideas from the researcher, faculty members, and colleagues from other parts of the department. They were not surprised being told that this issue must come from the fact that pre-learning might not be done adequately and effectively enough, since students barely had any accustomed learning habit of “doing pre-learning before going to class”. J Laoshi expressed her

thoughts of taking advantage of virtual space and offer them chances to sit together and do pre-learning as a team. With such inspiration, the CTP group members eventually agreed on the addition of two self-study sections in which facilitators monitors the whole class sitting together virtually, learning the vocabularies and grammar, and finishing the off-class tasks together. One of the self-study sections was facilitated by the teachers during office hour, which provided chance for students to ask questions in real-time if they came across any. The other section was students' teamwork, in which they were required to team up and take shared notes to document their gains during learning. These required get-togethers for pre-learning took away some of the self-planning freedom from the students, but guaranteed that students at least put time and efforts on finishing reading the textbook, going through lecture materials, and finishing the pre-learning tasks as planned. This was a thoughtful transitional period for students to actually accept pre-learning as a must-do in their learning cycle, and actually put time and efforts in it.

The revised new model was implemented in the second semester of the school year, and was considered by the CTP group as a successful planning after the school year finished. Instructors shared among their CTP group about their sense of achievement by running the course in responsive to the online shift and making amendment according to what they experienced and observed in the practice. This model has made more use than the teacher group firstly expected. Below are clips of teachers' reflection on the new models of course set-up:

"Small sized class make sure we can keep close track on how students learn. We know more about students and teach them as they need, and less students in the class have made it possible. Also, the self-study note-taking tasks makes students to produce a file of language that can be the source for synchronous teaching. We can check their google docs and identify errors they made. And we can target our teaching on the common ones, which is far more efficient than going

through all the language points plain. ” *(J Laoshi, Interview 4)*

“From the course we learnt a lot. I feel like the half-sized class is really helpful to build stronger connection among teachers and students, especially when we cannot see each other in-person. It helps a lot to keep the classroom interactive, and give students intensive opportunities to practice….Our self-study makes the intensive practice activities come true. I learnt that it is not realistic to request students to preview or pre-learn without any products expected. We need to come up with at least some sorts of tasks to motivate students, let them show their uptakes, and make sure they actually participate in the learning.” *(L Laoshi, Interview 4)*

“Students seems really making good use of these self-study sections. Without an actual classroom and school building space to meet and talk, this is the ultimate place for students to meet each other and get their collaborative work done. We have been working on creating opportunities and providing supports for them to keep up with the good work in these self-study sections.” *(Y Laoshi, Interview 4)*

The course set-up under the direction of flipped classroom idea has been a critical attempt made by the CTP group. This would not be possible, as J Laoshi mentioned in the follow-up interview, if the host department and the faculty supervisor did not express willingness to incorporate innovative course set-up with flexibility. The remodeled course set-up emphasized the meaningfulness of well-planned self-directed learning of content knowledge that invited students to take full advantage of their off-class learning time, as well as the practice-based learning to guide students from confined classroom context to a more interactive one in order to consolidate language learning through communicative approach. The three-component model (asynchronous lecturing+ self-directed learning sections + small-group synchronous sections) and the logic behind such planning could generally inspire future teaching preparation to be

interactive, targeted, and student-oriented. Especially meaningful was to make sure the efficacy of pre-learning, which was what a flipped classroom relied on. Merely course planning adjustments, however, could be not specific enough for an enhanced learning experience. It brought up further inquiries for teachers to discuss. For one thing, what activities could be appropriate facilitators and assessment tools of synchronous and asynchronous language learning that are applicable in their designed course? For another, what platform and materials are needed to technically realize the course planning and activity design?

As the school year is purely virtual, choosing a user-friendly platform to host all their innovative ideas could not be more important. Under the umbrella of a renewed course set-up, the next sub-object of teachers' expansive learning is about the use of appropriate digital platform(s).

6.2.2 Digital Platform use

It is genuine to think that choosing one platform for online class is about where would the classroom interaction be moved to. However, for language educators, elements that they need to take into account is far more than that. Considering the general course set-up that the studied CTP group agreed on, their rationalization of digital platform(s) when doing the online shift was consist of three segments: platform for synchronous sections, platform for asynchronous modules and off-class tasks, and platforms for interpersonal connection/socializations.

After reading the university and department instructions about remote classrooms, J Laoshi expressed her idea of choosing the platforms that were based on, or "embeddable" easily through Canvas, which was the comprehensive platform with the segments of Discussion board, Atomic assessment, Kaltura media space, and other integrated features. Canvas had already been used by

the university and some of the instructors before pandemic to make the class activities diverse and keep the information organized. She believed that as students and teachers are already familiar with canvas, the platform they already got used to could be a good choice. Hence it would not be a difficult transition if canvas would still be the information hub. With the 'simple is the best' logic in mind, the CTP group agreed on the canvas-based platform combination, which is BBC ultra for synchronous sections and all other virtual meetings, Canvas site for off-class activities, and emails/canvas messages for communication among teachers and students. BBC ultra, as experimented by J Laoshi during the pre-covid semesters, served fairly nicely for language classrooms where teachers and students needed to take turns and talk, and it was automatically canvas embedded so students were familiar with it enough and could get easy access. Canvas site provided a good collection of tools that facilitated course material distribution and helped conducting coursework, which included Kaltura media space for uploading and publishing lecture videos with captions available, Quizzes for creating and assigning atomic assessment, People for setting up group work, and Inbox for off-class communication between students and instructors. These components were not fully put into use before when classes were mostly in-person, , but was more fully explored and made better used of when the online platform became a must.

The transition was smooth at first as teachers tried to only make minimal changes for students to get used to. Canvas helped to put together all the off-class activities as an information hub. Students would be able to keep up with the pace with minimal confusion by following the homepage and identifying modules and to-dos of that week. In terms of all the pre-learning facilitation, teachers specifically expressed their appreciation of atomic assessment embedded in modules like vocabulary learning, which provided a dedicated comprehension check after each

content knowledge delivery segment, such as grammar lecture or vocabulary learning module, was accomplished. This was iconic for self-direct learning as students needed to be provided an offical wrap-up section to report to both the instructors and themselves about how the learning went, what they learnt, and what could be improved. Canvas-based atomic assessment made things easier and more interactive. Lastly, in terms of daily communication among teachers and students, the CTP group appeared to be less concerned with email communications happening as usual. Their discuss about students' feedback about communicating to classmates was mostly about not being able to spot their peer students for interactive off-class tasks. They did not attribute this issue to the communication platform of emails and canvas messages, which were not likely to conduct real-time communication as people would have in and around the class classroom when meeting in-person. But they do agree that a more real-time communication platform was needed.

One immediate concern when practicing teaching on this canvas-based platform, however, was during the virtual meetings and the synchronous sections. In the first several teacher meetings, technical issues from both teachers and students were frequently reported when using the BBC ultra for synchronous class, especially during the "rush hours" of the day (around 12pm-1pm). The server was not stable enough even for instructors and students who had high-speed internet connection. This could cause a frustrating pause of class all of a sudden. The CTP group felt the urgent need to make a change even though this was in the middle of a semester. BBC Ultra was given up after a month of trying. The instructional team discussed this with the researcher and accepted her advice of switching to Zoom. The researcher shared the experience in the summer course she taught where office hours was hosted through BBC ultra and switched to zoom smoothly because of a similar technical issue, which highly resonated with the situation

this instructional team was facing. Despite of not being embeddable into Canvas as seamlessly as BBC Ultra, Zoom had had a better history of, and was expected to be a better choice as the platform for synchronous discussion sections with stable server compatible with the internet connection available for most of the students. It was also more widely used internationally as a video conferencing software while hosting most features of BBC Ultra as an educational platform used by schools and universities specifically. They did not hesitate for very long before making the switch, and they believed it was a good choice. Although it was the first time all the instructors used Zoom, they did not experience a harsh transition time thanks to the workshop and Zoom tutorial sections provided by both the University and their department. Zoom remained their choice of synchronous discussion section platform throughout the entire school year.

Another platform choice that received critical consideration was the one for students' daily communication and community bonding. In the interviews conducted during winter break, the CTP group members all mentioned that the community-like connection among students was limited by not being able to make real-time communication as usual. Small talks before and after discussion sections are not practical for online classroom environment. Emails and canvas message could not solve the problem of teachers and students lacking a place to communicate informally as a group. Another communication platform, Discord, was added for better building the community at the beginning of Spring semester as suggested by the researcher. With another role of technology specialist, the researcher shared her positive experience using discord as the community playground for another course she worked on, in which students interacted with each other and created a sense of belonging even though the course was fully asynchronous. After being familiarized with Discord, J Laoshi agreed that it was a helpful platform for person-to-

person connection, class announcement in the server open channels, teamwork and group discussions in group voice channels. The instructional team had a strong feeling of incorporating discord as their essential space for off-class interaction, thus created a course-specific server to allow real-time communications as needed, including setting up the space to conduct their newly added self-study sections. Students would have a space to work together, discuss about their coursework, ask questions and further discuss coursework with instructors and update each other about their daily life in the server, thus created the community feeling more. Although it was not related to the Canvas system they previously solely based on, Discord was able to make itself to the core routine of the course because there was an urgent need for students and teachers, especially in a language course where communication was the goal and the key, to establish solid connection among each other.

The remodeled combination of Zoom for in-class, discord for off-class communication, canvas for course materials and assessment has fulfilled the expectation of the CTP group towards the course platform. While trying to be minimalist when incorporating outside platform other than canvas embedded ones, teachers were able to find the desirable balance to practice the course design and facilitate student learning with the most manageable time and learning cost. The application of Discord platform, in particular, has been highly valued by all three classroom teachers, as it "not merely provide space for self-study and troubleshooting during learning, but also create an atmosphere of learning community, in which students can communicate freely about and beyond coursework" *(Y Laoshi, Interview 4).* Also important was the information brought by educators from other fields and settings, which could inject new ideas that would never be imaginable if the vision is limited within this university Chinese language teaching group. For example, the proposal of incorporating discord was made by the researcher, who

learnt about the popularity among American teenagers in other educational setting. This sort of information is not always available for educators who come from a different culture and are less familiar with local youth culture. Educators also expected that they could help each other through sharing what they had tried during this challenging period of time to support each other, and to build up a model that fit their specific need for the specific course they taught in.

Choosing appropriate digital platforms could be the foundation of the online shift of their Chinese language course. Further inquiries deriving from the platform choice included the materials, activity, and assessments that were based on them, which embraced the abstract idea of flipped classroom and a skeleton of a remodeled course set-up. These will be discussed in the upcoming sections.

6.2.3 Off-class activity design

Upon setting up the course and choosing the platform to run all the class sections, the CTP group needed to design the activities and tasks to direct students' everyday learning. In terms of all the off-class activities, one may think planning those for their course would not be a big challenge, since the course planning and materials from the same course offered in previous semesters would be referentially helpful. But the studied CTP group was still confronted with some challenges that required adjustments and redesign. Previously in the in-person mode, off-class activities were essentially post-class tasks for learning consolidation. Students were expected to finish those tasks as a part of their review process after lecture and discussion sections. The newly modified course set-up for online course (reducing the discussion sections to 3 times a week with the asynchronous lecture), in reference to the workload requirement for a 4-credit course, required more dedication of students' off-class time when the class was offered

online-only.

As arranged in the flipped classroom approach, a pre-learning segment of content knowledge (grammar and vocabulary) learning was required before discussion sections to familiarize students with the target language that they would work on, which was crucial for their online course because successful off-class learning of the content knowledge could be the prerequisite of fruitful synchronous sections for practice. These pre-learning activities was new to both the students and the instructors, as explained by J Laoshi repeatedly, were basically changing students' preview work to a self-directed learning work, which was against students' previously formed habit of coming to class with a blank mind wishing to be furnished *(J Laoshi, Interview 2 and 3)*. This required a "full set of new materials and activity designs that could not be borrowed from anyone else, or at least some kind of fundamental adjustments" *(L Laoshi, Interview 2)*. Also, as there were no physically presentable assignments options available anymore (e.g. handwritten workbooks, in-person dialogues and role plays, etc.), alternative methods were needed for students to present their product of off-class learning *(J Laoshi, L Laoshi and Y Laoshi, CTP Meeting, Sep 2nd and Sep 9th)*. These questionings of their off-class activity planning work led to teachers' attempts to adjust the off-class activities planned and conducted in the traditional course design, to develop interactive activities that exceeded the limit of lacking in-person classroom component, to facilitate pre-learning as a major segment of students' knowledge acquisition, and to push the boundaries of "classrooms" in the online asynchronous learning space.

Initial solution modeled by the CTP group purposefully targeted at the start of students' learning cycle as their pre-learning period in which asynchronous lectures, comprehension check for grammar learning and vocabulary learning were expected to be finished. Activities were set

up around the asynchronous lecture and students' uptake when and after watching the lecturing video. During- and post-lecture questions as comprehension check for the asynchronous lectures not only helped teachers to keep track on student learning, but also provided chances for students to revisit the language points being introduced asynchronously. Atomic Assessment being the handy technological support to digitalize their workbooks and work sheets, the instructional team discussed how to revise some of their previous paper-based tasks to a digital-friendly version. All instructor believed that handwriting and typing held their uniqueness in Chinese language learning. Since Chinese as a pictographic language has the specialty of using characters instead of alphabet systems, being able to work with characters in addition to Pinyin (the alphabetical phonetic notation system of Chinese) is critical, and typing on computer using PinYin should be one important but not all segment of their written-form production skills. Handwriting should be of the same importance as typing. They made sure to keep hand-written tasks by requiring students to scan/photo their assignment sheets for submission, but also recognized that some type-in tasks could practice their digital literacy skills while making the assignments less time-consuming.

Besides the pre-learning tasks illustrated above, traditional activities that used to be for reviewing purpose were still an important segment of off-class activities. The instructors scanned or transferred some of the previous workbook tasks onto canvas if they were still applicable to the current course set-up. What was more, the CTP group also predicted that with the content knowledge pre-learning being silent individual tasks and discussion sections being the interactive practice of language, students would have less chance to reach the textbook and get enough input of those contents. Teachers decided to alternate textbook materials into sources for post-learning off-class activities. One was for reading comprehension tasks in which students

revisited the textbook dialogue and answer questions accordingly. The instructional team discussed how to plan this task "creatively to make them more colorful than some multiple choice questions" *(J Laoshi, CTP meeting, Sep 16th)*. For instance, they came up with the task of "visualizing the dialogue" that asks students to draw a picture story based on the dialogue(s) of the unit (see Figure 18 for a screenshot from the canvas site of a sample assignment);. Another activity was "Dubbing" in which students were invited to record and fill in the muted part of the dialogue video with what they just learnt (see Figure 19 for a screenshot from the canvas site of a sample assignment). There was also a regular task called "Dialogue with peers" in which students were paired up one another to make dialogues using the newly learnt language patterns freely. The CTP group designed these tasks in order to invite students to go over the textbook,

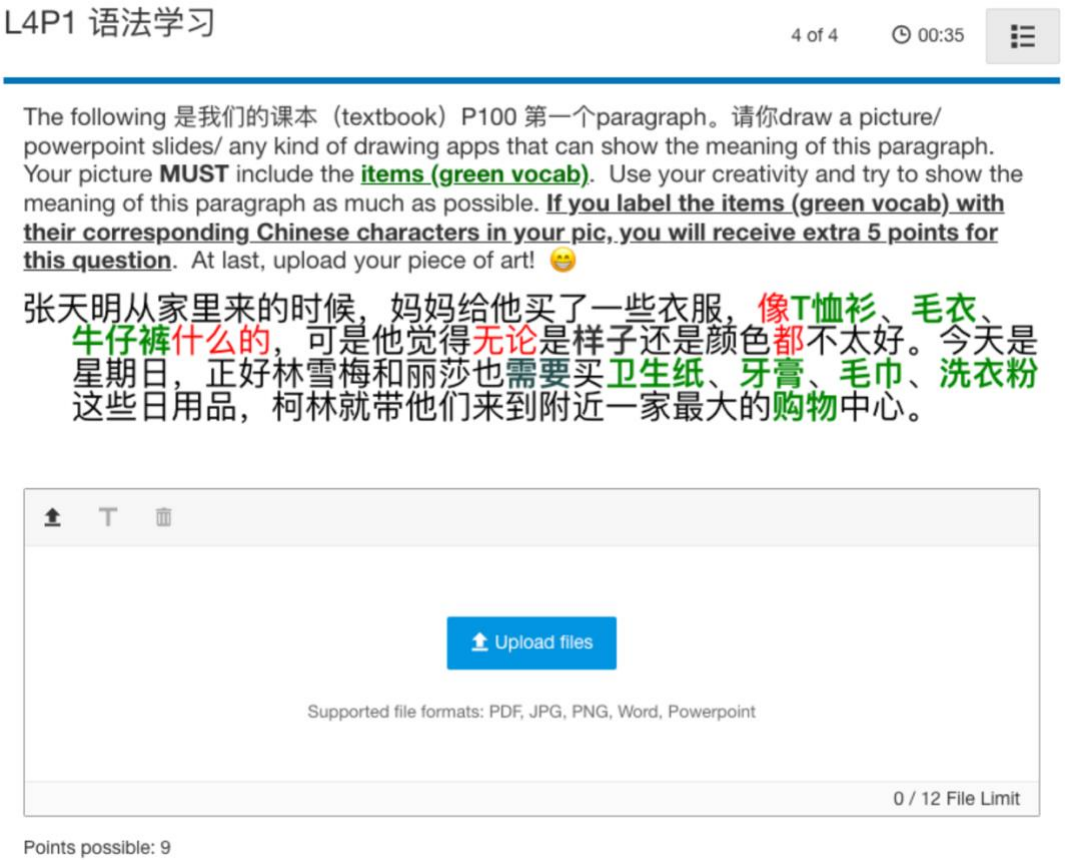

Figure 18 Visualizing the textbook dialogue, assignment sample (J Laoshi, Interview 4)

Figure 19 Dubbing assignment page (L Laoshi, Interview 5)

and hopefully read aloud the dialogue two to three times, which could be helpful for them to understand the typical contexts that their learnt language patterns were from. The instructional team referred it to the theory in communicative second language teaching (Richards, 2005) that sequence of language teaching could start from mechanical controlled practice towards communicative free speech. They also expected those activities to diversify students' off-class activities beyond writing assignments.

Within the beginning weeks of the school year, the instructors closely monitored the try-outs of off-class activities, both pre-learning and post-learning, and as a CTP group critically discussed what they witnessed from synchronous sections, assignment grading, and students' feedback. Through the synchronous interaction with students, instructors realized that some of their pre-learning activities presented through Atomic Assessments following the grammar lecturing and vocabulary self-learning, although being done and scored high by most of the students, could not guarantee that all the language points have been "ready to use" *(Y Laoshi,*

Interview 2) for discussion sections. This resulted in a noticeably less optimistic learning experience in the synchronous virtual classrooms where teachers assumed students were ready for some communicative tasks using the language points pre-leanrt. Also questionable was the students' post-learning tasks in which students were expected to make sure the target language uptake was successfully merged into their communicative repertoire. Realistically, students were not provided a chance to put learnt language into practice off-script, since the time and space were not available for them to make personal and social connection with classmates and/or other people who communicated in Mandarin. This resulted in the students' frustration during the discussion section in following weeks when activities were based on instructors' assumption that students were able to communicate with the target language from previously acquired. In addition, the teachers noticed a less lively atmosphere around the synchronous virtual classroom, which indicated that students felt a less sense of learning community. Not only had students been lacking the opportunity to interact with peers during day-to-day small talks which are crucial for language learning (see Hunter, 2012; Yates & Major, 2015), their Dialogue with peers assignments were also running out of interesting topics because they were not close to each other enough to extend the dialogues out of the safe zone of textbook.

Changes of the models were made in the second semester upon closely reflecting on both teachers' observations as well as students learning outcome and learning feedback. Discord, as mentioned in section 2.2, became the epic center where most of the off-class community interaction took place. It was regarded by the CTP group as "a casual, leisure space for the class". As students came to synchronous sections three times a week, during the two days when they did not go to class, they were expected to come to the discord study room, team up with other three students and do self-study in groups. Out of these two self-study sections, one was

teacher-led, and the other one was student-led. To be more specific, students who had Monday/Wednesday/Friday synchronous sections should have Tuesday teacher-led self-study sections and Thursday student-led self-study sections, and Tuesday/Thursday/Friday synchronous sections participants would have Monday teacher-led and Wednesday student-led self-study sections. Through the requirement of attending study group activities, it was made clear to the students that the two days without synchronous sections should not be their days off. Pre-learning tasks, especially those asynchronous content knowledge learning ones, should be accomplished in self-study sections before relevant language points appeared in discussion sections—so students should not wait until the teachers to feed knowledge to them but try to acquire those actively and exploratorily. To provide sufficient support, teachers decided to move their office hours to teacher-led self-study sections in order to be accessible for students when they need help finishing their off-class activities and assignments during self-study. A group study note (see Figure 21 as an example) was expected from each study group each week throughout the semester so that teachers could check on their learning process, as well as understand what they successfully learnt and what they were not paying enough attention towards, then react on their learning needs accordingly. The profiles of group notes also served as learning portfolios for student groups to document the progress made over-time. Students could also make good use of these sections as chances of connection, asking teachers questions like they met teachers in their virtual office hours, or teaming up with their peers to finish collaborative assignments without bothering to set up another meeting time. Besides the strategic use of Discord for self-study activities, the CTP group also tried to maximize the communicative features of their activity design. To make up the lack of interpersonal interaction, an innovative "language partnership" activity was proposed by J Laoshi in Interview 3, and was eventually put

into practice. This activity was able to connect the students one-on-one to their "language learning partners", who were a group of Chinese college students majoring in Teaching Chinese as a Second Language—thanks to Zoom which broke through the geographical limitation of physical classrooms. College students from the East and the West were expected to talk freely in their bi-weekly meet-ups and discuss something that are of common interests of them two, thus get to know each other's culture and background more.

Figure 20 Sample self-study note, sentence composing, edited by Y Laoshi

After trying these models of off-class activities, teachers reported positively about their attempts both in their teacher meetings and in their interviews with the researcher despite some of the unsolved limitations. As flipped classroom shifted the burden of post-class review tasks to pre-class learning tasks, strategically planned activities helped securing students' learning time and fostering students' habits of learning by themselves so that they could come to class being ready for practice. Rather than expecting students to demonstrate their learning outcomes in the atomic assessment questions and in-class practice performance, the CTP group discovered that guiding them through the actual learning practice by hosting self-study groups in virtual spaces and documenting learning progresses in digital portfolio were more motivative and effective. The online version of communicative tasks and digitalized comprehension check questions, on the other hand, opened up new possibilities for language instructors to incorporate multimedia and technology and diversify the forms of activities. Both Y Laoshi and L Laoshi firmly believed that upon overcoming the challenge of technical issues, these newly developed course activities, especially the creative ones that were canvas-based and technology intensive, could be extended to the regular language courses as after-class tasks.

Some directly relevant further inquiries expected from the CTP group included the supplemental materials preparation and production for the newly and previously designed course segments. As an example, to present the dubbing activity to students, teachers challenged themselves to learn how to produce video clips for the task, and this became an emergent topic for the CTP group. This is one of the questions that the CTP group faced to for digital course material preparation. Also important is the accompanying in-class activity designs that fulfilled the need of practice in virtual classrooms and constructed a full online language learning experience for students, as well as teachers' well-being concerns resulting from the extra work

dedicated to making sure all the innovative activities were well-prepared. These will be discussed in the following sections.

6.2.4 In-class pedagogical revision

Getting content knowledge delivery done as pre-learning activities did not mean that synchronous discussion sections could be loosely prepared with less organized activities. Under the course planning of the CTP group under flipped classroom approach, a significant number of in-class activities and teachers' pedagogical efforts conducting these activities were designed for "practice", which was essentially putting all the target language from textbooks into context and guiding students to use what had been learnt. Although hosting in-class interactive practices was not something unfamiliar with the instructional team, the contextual elements, especially the modality of the course and the everchanging situation during covid, complicated the pedagogical decisions and made it necessary for instructors to absorb information comprehensively and conduct teaching responsively. In CTP meetings instructors shared thoughts and concern about what they experienced or witnessed in classrooms, then came up with new models of pedagogical practice to perfect students' learning outcomes.

Concerns because of virtual classroom being the essential space for interaction were raised frequently at the beginning, which was genuine for a group of instructors who had limited experiences teaching online courses. The instructional team decided to start from modifying the previously used in-class activities borrowed from previous instructors of the same course into a technology-friendly version, and if necessary, create new ones, in order to get students actively engaged and interact with each other despite of the constraint of lacking in-person communicative opportunities. It was also anticipated that students would not be fully familiar

with the online course platform, especially when working with activities that were out of their comfort zone of previously experienced models of language learning. Effectiveness of classroom interaction via video conferencing platforms (BBC Ultra and Zoom) could be the essential challenge for most of the synchronous activities, as the CTP group could hardly escape from the fact that students were not always willing to turn their cameras and microphones on, or simply did not focus on learning when instructors could not keep an eye on them as close as previous in-person class time. The previously discussed new course set-up of down-sized synchronous discussion sections and an updated weekly activities design that made good use of the existence of peers were part of their new model considering the need to boost student engagements in real-world communications. Guided by the newly proposed model of online course, during the CTP meetings, instructors carefully went through tools that were embedded in their class platforms of Canvas and BBC Ultra/Zoom, trained themselves to be more fluent with all the functions that were available to used, explore options that are made possible by the virtual space, and reminded each other to be patience and flexible in case technical issues happened in class. For instance, during the first CTP group meeting before Fall semester started, the instructional team dedicated a whole chunk of time demoing the Break-out room, Whiteboard, screensharing, as well as other outside digital tool they might want to incorporate during class (e.g. youtube video[5], wordcloud[6], quizlet[7], etc.). They also agreed on preparing extra activities as back-ups in case the designed in-class activities could not be accomplished due to technology issues of any kinds. These attempts made sure instructors were well-prepared to wisely use the class time and handle any issues they could imagine in advance.

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[5] Website: https://www.youtube.com/
[6] Website: https://www.wordclouds.com/
[7] Website: https://quizlet.com/

Beyond this, what the instructors witnessed and experienced during the discussion sections in the first several weeks led them to a more student-oriented perspective of thinking. Students being expected to participate in the practice activities virtually after watching the demonstration of language points by themselves raised their attention in regards of two aspects. Firstly, due to the unfamiliarity towards pre-learning activities (discussed in section 2.3), different students may not be on the same page understanding the off-class grammar and vocabulary instructions, so they needed teachers to capture the core learning object briefly, preferably before diving into intensive practice in each discussion sections. Secondly, instead of freely utilizing the shared physical space to mingle and talk, students would not automatically have the chance to interact with peer students and make comprehension check of the content being delivered and the activities being introduced to the group, so they required neat and straightforward teacher talk for the exact amount of information that they needed at that moment.

To overcome these issues and successfully practice activities meaningfully in class, the instructional team started to carefully plan for the content knowledge presentation in class. They realized that they should not skip the language point briefing sections because students would need to double check what they acquire from asynchronous lectures was on the right track. But this briefing should not take long as the discussion sections should focus more on practice instead of presentation. In order to precisely and efficiently illustrate the language points during discussion sections, instructors carefully went through the content knowledge among themselves during the CTP meetings to make sure they accurately grasped what students would need to accomplish in-class learning activities. For example, directional complement was a hard-to-understand grammar pattern that might need clarification and intensive in-class exercise. The instructional team took more than half an hour in the meeting to confirm all three of the

instructors understood the grammar pattern, and agree on the series of examples that were used to clarify the structure. Teachers attached great importance to this attempt:

> "The content clarification is important because we need to be on the same page understanding the knowledge we are going to teach, and be familiar with how the content is demonstrated on our PowerPoints. It is especially helpful for me as a….not as experienced Chinese teacher"—*L Laoshi, Interview 3*

Besides clearing up the knowledge obstacles of doing the in-class activities, teachers also made attempts to make sure the activities were instructed easily enough from the students to follow step-by-step, since their clarification would feel distant through online platform. They composed the instruction and rehearsed the activities among the group, and collect practical suggestions how could the demonstration of needed information be simple and accurate. To understand the situation of in-class interaction and how should teaching be improved, the CTP group also agreed on openning the door for peer observation. Y Laoshi and L Laoshi, who were less experienced in teaching, were encouraged to sit in J Laoshi's class if they were in need of inspiration how to be more effective delivering knowledge to students, and how to conduct activities in an engaging way. J Laoshi and the researcher, who were more experienced language instructors, were also invited to sit in Y Laoshi and L Laoshi's classrooms in order to provide some feedbacks and suggestions. They discussed about detailed problems they noticed in each other's teaching frankly, and make suggestions accordingly. As none of the three teachers were confidently experienced in teaching technology intensive classes, discussions sometimes went towards an open-ended solution. One important issue that was brought up after observation was teacher talk. J Laoshi echoed with the researchers' suggestion that teacher talk should be carefully managed especially in virtual classrooms. This was because students would be more

likely to lose track on what teachers said if they unnecessarily talk about too many details, and would be confused if they could not grasp all needed information for understanding the content knowledge or the instructions for activities. This, for J Laoshi, meant that she might need to sense the fragility of online classroom atmosphere, step in and offer some further information when one student was having trouble moving forward with the activities. But for L Laoshi, it might mean she needed to feel comfortable leaving silent time for the class so that students have time to process the information circulating in their brains. Another frequent topic was monitoring the breakout room activities. Through observing the others, the group put together several tips for monitoring language learning activities through platforms like zoom. Firstly, keep a comfortable distance with the students by showing their interests and participation listening to the dialogues but not disturbing students' language output. Secondly, put in guiding questions rather than directly provide an answer to the problems students were working on. Thirdly, provide collective feedback in the activity wrap-up by friendly pointing out what was wrong in their group activities and how would be one possible way to fix it.

Individual teachers were also actively reflecting on their teaching and brought up questions that they came across for CTP group discussion. For example: L Laoshi brought up her confusion during teacher meetings about students' low energy engaging in the activities especially at the beginning of class. Based on the observation that the other CTP group teachers did in her classes, they collaborative identified the roots of the issue as 1) students were missing the "activate" part of each class—small talk and interacting with activity group member—because of the virtual classroom settings; 2) The activity instructions were lengthy and hard to be passionate about. Students would hold back and refrain from making the first try. In response, teachers agreed on the following solution as new models to facilitate online group activities: 1) Explicitly invite

students to talk to each other and chat about themselves at the beginning activity of each discussion groups; 2) Provide simple keywords of activity steps for students to follow on the breakout room screen during the activity time; 3) Actively monitor in each breakout rooms, be present with minimal interruption, just to see if the group work is moving forward.

During their collaborative preparation of making better in-class pedagogical choices, instructors realized that despite of the requirements and course design being clear about discussion sections being the space for post-learning practice, most of their efforts lied in how to be effective and efficient to clarify themselves, and how to keep students on track as much as possible under the condition of online teaching. This, as mentioned by L Laoshi *(Interview 2)* took the CTP group more energy than designing technologically friendly activities, as planning activities were more predictable than reacting on students' self-directed learning outcome and making sure they were proceeding in the right direction. This was evident during the CTP group meetings when they recalled their weekly progress. Instructors constantly reflected on their frustration of not being able to complete their weekly lesson plan, obstacles of their progression, and potential ways in which meaningful learning experience could be facilitated in the coming week, which required their sensitivity about the virtual classroom context and student-responsiveness in order to teach responsibly.

Pedagogical attempts in virtual classrooms during the online school year witnessed these language instructors' strategic decision of the lesson plans, innovative application of tools and method to improved student engagement,improved accuracy of content knowledge delivery, and appropriate approaches communicating with students. These, although can be context-specific for some circumstances happened for the unique class group, built up the instructors' sensitivity of the situation they taught in, as well as their awareness of their own mission in the online

classroom, students' real-time feedback, and flow of classroom interaction. The process of their negotiation, agreement reaching and amendment making about their in-class pedagogy would be a good reference about how instructors could actively execute the course more learner friendly.

One inescapable element of the virtual language classroom practice was the use of supplement course materials, including ones for in-class activities such as PowerPoints and google slides, as well as ones for off-class activities such as lecture videos, atomic assessments and virtual workbooks. Those materials should be made straightly targeting at the object of each learning activities with an reasonable amount of information, and teachers should be very clear about every element in those materials to make good use of them. All details in the materials should be incorporated in a logical manner to enhance rather than interrupt students' learning. This leads to the theme related to preparing course material that are "user-friendly" for both teachers and students at all time. This will be discussed in the following section.

6.2.5 Digital course material preparation

Although Chinese language program that the CTP group work in had a developed curriculum and built-up system of program design, the instructional team still considered it important to contextualize their pre-prepared course materials in response to the specific classrooms and student groups. New modality of language teaching, new configuration of classroom, new digital platform use, and new forms of assessment implied a major adjustment that was needed in their teaching preparation. Instructors started negotiating about how to collaboratively produce all the materials needed in their meetings and began preparing before the Fall semester starts.

As mentioned in section 1.3, collaborative preparation of course material consisted of both

digitalization/modification of the old and creation/innovation of the new. In terms of modifying the old, the CTP group borrowed teaching materials package from previous teaching team, which provided a foundation and overall direction of their own preparation. As a member of previous teaching team of the same course, J Laoshi shared their pervious teamwork pattern during previous semesters that all the instructional team members rotated to be leaders for the preparation of teaching material, and the leader of that week also led the discussion during teacher meetings deciding what in their existing collection should be kept unchanged and what could be used after slight modification. For instance, as a part of larger Chinese language program curriculum, their course needed to keep similar learning objects and expect similar outcomes so that students could level up smoothly in their language proficiency growth. With the same academic week counts and textbook version, their module outline and the learning object should not be amended significantly. On the other hand, with course set-up and activity planning being renovated for a technology-intensive context, teachers would be likely to frame the course and put in practical details differently, which included modification of previous material, and when needed, creating new material when noticing previous material amendment could not help the instructional team attain the goal of teaching. Specifically important was the assignment and assessment part, which were in need of major amendment. In their CTP meetings, instructors dedicated a major portion of time confirming the details of their amended description of how the class activities and assessment would be carried out. J Laoshi took the lead to modify the new syllabus, which was proofread and revised by Y Laoshi and L Laoshi. They chose to be honest about some undecided portion of it by putting “TBD” in the blank as they wanted the chance and flexibility to observe how would everything go on. When it comes to the routine teaching materials such as lesson plans, PowerPoints and other teaching supplements used in class, forms

of assessment materials, they would like to be as specific and detailed as possible. Rotate teaching being planned as a feature of the revised course set-up attached great importance to the consistency of detailed lesson plan launched by different instructors across discussion sections. With the tradition to collectively prepare for classes, all instructors chose to prepare and use the same set of course materials, so they divided the work task by task, having one leading preparer for each task with the rest of them as support giver. As J Laoshi got access to previous semester materials, she took charge of asynchronous lecture and relevant atomic assessment content. Y Laoshi and L Laoshi would each take one of the other two portions of weekly preparation work, lesson preparation (activity planning and Powerpoints making) and technical production (make digital materials such as recordings, videos for exercises and assessments. Teachers applied their collective wisdom to come up with new activities and/or new approaches to conduct in-class or off-class activities, and course materials innovation should really combat the challenge of technology intensive environment and convey these ideas in teaching and learning practice . To provide a simple example, some of the listening activities on Canvas atomic assessments are newly equipped and added into their routine exercises intentionally in response to the lack of chances to hear people talking, so the listening exercise materials, the audio pieces of an authentic Chinese dialogue, were prepared by the CTP group.

To produce the course materials as desire, especially those which are not regularly applicable in a traditional in-person course design, the CTP group attended workshops and training sections that helped teachers with technological literacy skill mastery. All the teachers in the CTP group mentioned about the department-led and university-led teacher training workshops before the school year started as helpful in terms of familiarizing teachers with forms of technology that can be integrated in these material preparation process--such as Canvas, Kaltura media space, atomic

assessment, and more. These workshops inspired teachers' exploration of specific technological tools by providing general information and demonstrate the basics of how to use them, while leaving the big body of course-specific utilization open to exploration by the CTP group. As flipped classroom requires a different set of in-class and off-class plans, teaching materials could be crucial for the realization of new course design and supplement new activities. During weekly meetings, teachers discussed about the material preparation using the skills they learnt from workshops, and reminded each other about the parts that were less familiar. Upon realizing the need of a specific technological skill not acquired before, the CTP group decided to reach out to individuals who may be able to help, and invite them to provide tutorials as they need. Video editing and captioning skills, for example, is of critical need among the CTP group in order to prepare video materials for the dubbing activity each week. The researcher was able to give a short introduction section about how to use the software to fulfill the need of producing materials for their intended off-class activity, and provided one example for the CTP group to refer to. Instead of escaping from the challenge of learning and trying brand new software, teachers in the CTP group were willing to learn as they believe it would largely enrich students' learning experiences during off-class time, which is of great importance for their flipped classroom course design.

However, getting familiar with the technological tools and learning how to use them is merely the first step of their success to produce digital materials for the course. The CTP group understood that the material preparation should be accurate in content, and practical for classroom use. As the CTP group was not consist of all experienced teachers of Chinese language course, they noticed, after experiencing some unexpected ambiguity when trying to explain the language to students in their teaching practice, that they needed to collaboratively

clarify the content knowledge and explain the pedagogical application of specific knowledge during the CTP group meeting before confirming the teaching materials were ready to use for all teachers. J Laoshi, as the most experienced teacher, took the lead to go through the prepared materials and make sure the target knowledge was appropriately presented. It is especially salient when it came to preparing the PowerPoints for synchronous discussion sections, which was mostly led by Y Laoshi and L Laoshi. Although they had access to the slides made by teachers of previous semesters, the instructional team was aware that those PowerPoints needed significant modifications. The changing lesson and activity design that needed to be presented in the slides was part of the reason for modification. Also, the modality how the slides would be presented to students was nothing similar to in-person classrooms, which is also part of the reason. In the configuration of their online synchronous classroom, either BBC Ultra in the first month or Zoom for the rest of the school year, the screen layout would be dominated by shared screen slides, making the image of the teacher and other classroom participants confined in a small corner of the screen doing limited interaction with each other. Students' attention would be dominated by reading the material on the PowerPoints, which makes the existence of text on the slides a core knowledge delivery approach rather than a supplement material to assist instructors' teaching practice, which was how their slides in previous in-person classrooms functioned. The instructional team agreed on making PowerPoints with enough animation, or finding a way to show language points piece by piece with appropriate font size so that teachers were able to control the pace of the material instead of having a full page of language points available to be read all at once. Also needed were more visualized illustration of the language points. As gestures and body languages were hard to be delivered in online synchronous platforms compared with in-person interaction, they believe that visualization would be a booster for

students to understand verbal explanation.

Course materials were essentially the joint part where both instructors' teaching and students' learning relied on. All the remodeling mentioned above were made to better serve a specific context and specific student groups. Observation about in-class and off-class activity completion and effectiveness led to frank and critical comments about what teachers had not considered enough, and how their next week material preparation might better serve their teaching and/or facilitate student learning. The observation of lower-than-expected quality pre-learning and in-class interaction (discussed in section 6.2.3) questioned whether grammar videos, vocabulary learning materials, and relevant atomic assessment did their job to deliver the knowledge to learners before the interactive learning took place in synchronous sections, then urged for changes if the materials were not appropriate enough. For example, J Laoshi found one of the pre-recorded grammar lectures they borrowed from summer program was too lengthy for students to follow, and the atomic assessment exercise following that lecture reflected a less desirable knowledge acquisition result by directly quoting the grammar explanation instead of providing practical usage indications such as phrases and sample sentences. The instructional team, after several unsuccessful try-outs to edit the lengthy video, decided to opt out from pre-recorded materials, and used open-source videos to present the target language points. All members of the CTP group, including the researcher, would not hesitate to provide ideas and put on efforts collaboratively towards a better design of the material, and help each other to amend their collective product until ready to use.

Overall, the instructional team believed that the collaborative efforts in preparing the materials really made a difference. Participating in workshops and training sections for online language teaching enriched teachers' skill set of making professional and innovative teaching

material, and the teamwork pattern of teaching preparation opened up possibilities for teachers to maximize their efficiency, and further learn through practice and from each other. At the same time, they realized that some core issue of the activities and course materials were not identifiable without learning assessments. Planning for a series of assessment that meaningfully reflect students' learning is of great importance for the teacher groups to make next-step decisions.

6.2.6 Assessment and evaluation

Assessment and Evaluation in this Chinese language program has been mostly not digitalized before pandemic. According to J Laoshi, their major assessment compartments—Participation, Homework/Workbook, Quizzes, Midterm, and Final exam, used to be conducted in a relatively traditional way, and the integration of technology during the online school year has shifted the forms of assessments differently. For types of summative assessments such as quizzes and exams, major challenges for the assessment process were 1) students could not have physical access to worksheets and test paper, so teachers needed a different modality of distributing the materials and providing feedback; 2) they could not host exams as how they previously did, making it hard to conduct quizzes and exams as usual. Accompanying the technical issues are the changing nature of literacy emphasized by the online shift of language learning. As mentioned in section 6.2.3, during the pre-semester meeting, the instructional team agreed on the importance of handwriting despite of the reality that typing dominates digital age language use. Their design of assessment alternatives should make sure that students could be literate in both traditional and digital ways. Formative assessments such as participation and other newly designed off-class activities that facilitate language practice, on the other hand, were featured from an emphasis on

using rather than knowing the language. By carrying out activities for students to interact either with real person or the computer, teachers would be able to help students with their communicative skills, and to provide feedback on appropriateness of language use in context.

With these thoughts in mind, previous combination of summative and formative assessment applied in current flipped classroom course design witnessed instructors' collaborative thinking about learning facilitation instead of standardized test. Summative assessments were modified largely. Instead of moving traditional testing to an honor-lock monitored mechanism, the instructional team opted their exams to open-ended questions, which, as J Laoshi mentioned, aimed at letting students study for it instead of measuring their study with a score. As a lot of multiple-choice questions and vocabulary learning questions were given to students in the pre-learning segment, the exams skipped those parts and focused on speaking and writing tasks. Speaking tests remained similar, in which students meet the teachers and answer questions in real-time. Their performance of how smooth their communication was when connected with people, as the CTP group agreed on, played more important roles than how many grammatically correct sentences were produced. The writing part of the tests took over the grammar check mission by asking students to do practical writing with recently learnt grammar patterns. Instructors believed that such writing task design could invite students to be prepared for using the grammar patterns in the contexts they belonged to, rather than reciting what the patterns were consist of without thinking about where to use them. It also required a comprehensive ability to utilize the language with appropriateness, which, as J Laoshi believed, could be hard to cheat on. She believed that students' possible usage of cheat sheets in tests could be the exact process of learning the pattern and then applying it *(J Laoshi, CTP group meeting, Oct 9th)*. But the level of internalization of was easy to tell between students who understood the language points and

those who just learnt about it from their cheat sheets. This form of testing was kept throughout the school year.

Participation and homework tasks, two of the formative assessment approaches, were kept as usual, with newly added component of canvas atomic assessment. Designed based on their revised course set-up, students' formative assessments started from their participation weekly watching asynchronous lecture videos and vocabulary learning materials and completing the questions via Atomic Assessment. Following the pre-learning segment, students were expected to come to class, actively participate in the activities, review what they learnt after class, and finish their after-class tasks assigned on Canvas, such as dubbing, dialogue with peers, and writing. Instructors expected the discussion section to be the divider of "input' and "output" tasks. Before discussions, students were assessed about their acceptance of all the knowledge being input during the pre-learning. After discussions, students were assessed about the capability to output the language in a relevant context.

It brought into the teachers' attention after half of the fall semester that a huge unbalance was discovered between the input and output assessment accomplishment. Students' assessment performance in productive tasks were significantly left behind, which was interpreted by the instructional team as that students' achievement in pre-learning atomic assessments was sugar-coated, and the internalization of newly learnt language needed improving. This matched with CTP group members observation in each other's classroom, as discussed in teacher meetings, that some of the language points that students were supposed to be familiarized with before discussion sections sounded brand new in class despite students seemed to learn those successfully as indicated in the pre-learning assessment accuracy report. A more meaningful pre-learning activity and assessment was needed to better involve students in learning. The teacher-

led and student-led self-learning sections (discussed in section 6.2.3) fulfilled this need, and students are assessed by their efforts putting together their learning notes each section, which eventually turned to a learning portfolio of the semester. Teachers valued the engagement more than the correctness, and provide feedbacks about whether students were able to grasp the most important segment of the content, or whether they made errors when utilizing the patterns just learnt in the notes.

Answer keys of multiple-choice questions were provided right after the tasks considering it was important to get immediate feedback if some comprehension was not done properly before they leave the learning section. Feedbacks of productive tasks such as dubbing, dialogues, and learning portfolios were provided before the discussion sections in which relevant content should be covered. This became the essential approach how teachers keep tracking on students' learning progress and plan for their teaching accordingly, which was critical for the flipped classroom approach.

The instructional team believed that overall they made decisions that were helpful to facilitate learning, especially during the time when physical paper and in-person exams were not realistic. Their design of various formats of assessments took the feature of online language course platform into consideration, covered all aspects of listening speaking reading and writing, while emphasizing the awareness raising of language use instead of language point memorizing, which was critically important in their vision for flipped classroom approach. In terms of the platform of Canvas, both J Laoshi and L Laoshi specifically mentioned that what could be annoying was that there was no hand-writing friendly options (they did not support ipad or touchpad hand-writing input), which could be a limitation for students to do handwritten assignments and for teachers to grade those (also see course platform related issue, detailed in

section 6.2.2). Nevertheless, Canvas, especially the atomic assessment tool, had a lot of multimedia features of embedding video and audio content into tests, which was, as a form of digital age literacy, not available in former paper-based tests. Digital assessments through production tasks also could be the most direct opportunity to track monitor their progress overtime by preserving their finished assignments and assessments, thus allowed instructional team to discuss about the next-step teaching plan. Instructors specifically mentioned that their try-out of assessing students through activities that are technology-integrated could be generalized to all modalities of language teaching. A hybrid modality of learning assessment could be their future choice regardless of course modality and platform used in order to understand whether students were competent using the language they learnt in various forms of communication.

It's worth mentioning that teachers' thinking about assessment should be part of their reflection about how their activities, both their in-class activities for students to participate and their off-class activities for students to document and evaluate learning, were designed and conducted with care. Students' efforts dedicated to their Chinese language learning and the outcome they get from the course should be meaningfully corresponding. This indicated that instructors' work of evaluating students and students' sense of learning achievement during learning could be reconsidered in relation to the overall circumstances of their learning, which was largely impacted by the online shift of the course. Also important for the group was the grading process, as it "occupied a big chunk of our off-class working time, and sometimes made us overwork" *(L Laoshi, Interview 2)*. These were the interconnected aspects that the group further considered when making decisions for assessments. The workload and well-being aspect of teachers and students, being one of the very important segments of teaching, is specifically

discussed in the next section.

6.2.7 Workload management and selfcare for both teachers and students

Well-being and selfcare were at the center of during-COVID teaching planning. Every individual during pandemic would not want to put themselves in an unfavorable position of getting infected, or getting mentally drained by social distancing, working, learning virtually, or other related mental health issues. This set the tone of letting health concern be the critical contextual element of student learning and teacher working among the CTP group. On the other hand, technology integration has changed the work pattern of both teaching and learning, requiring students and teachers to make decisions for scheduling and planning in response. Both aspects were discussed within the CTP group.

In terms of considering students' selfcare, especially the tough situation of COVID during the school year, the CTP group's decision combined the perspectives of both teachers and students, as all group members are graduate students besides working in their department as a language teacher. In the first pre-semester meeting, they discussed about potential adjustments that they should get ready for, including policies if students reported COVID, suffering from physical and mental health difficulties, and other potential challenges they may face to because of the adding layer of COVID situation in their planning. Teachers agreed on the idea that these adjustments should not be excuses for students to be left behind in their learning, but rather giving them more flexibility to learn in a manageable pace (J Laoshi, 0902 meeting). For instance, students are allowed to attend synchronous discussions in parallel sections if there are short term changes or emergencies to deal with in their schedule. students are also offered excused absences so that potential tension between their coursework completion and

health/mental care could be eased. Beyond these, students are encouraged to discuss with teachers about their individual needs and reach out for help or suggestions during the time they planned for "individual sections" during their office hours. This was, as the CTP group collectively imagined, also a good opportunity to engage students into interpersonal language use that they might not be able to do by themselves. This was helpful, as reflected by Y Laoshi (Interview 2), in terms of getting information about how was going on with students' learning and everyday life, as well as checking their progress in study. Technology-intensive learning, as imagined by the CTP group, also brought challenges for students. Teachers predicted issue for students to get used to multiple platforms and accounts, especially if those are complicated to navigate. Other potential issues included internet access, bandwidth, and software version, etc., which could impact students' learning experience at a technical level. Teachers were highly aware of these issues and, under the reminder of the researcher, noticed the equity concern of the universality of high-speed internet, safe space and other technical element that one may take for granted. As they were not able to foresee the problem before students exposed it, they agreed on an open-minded attitude to make adjustments as needed.

Semester proceeding, the workload for students became the major concern. As discussed above, students were not used to have pre-learning of any kind, so they intuitively thought the pre-learning tasks and exercises are their extra work beyond their regular homework—especially when they are expected to be finished outside their class meeting time. Lacking pre-learning efforts made students perform poorly in synchronous discussion sections, as teachers were actually ready to put what they pre-learnt into exercises and dialogues without knowing they are not even familiar with the language being practiced. The teachers received several complaints about the course was at an over-speeded tempo or the off-class work was too much to handle

before they realized this was because students did not really understand the pre-learning as a portion of the discussion sections instead of homework and felt overwhelming by it. The second semester witnessed the remodel of dealing with this issue of—starting self-study sections. This not only clarified that pre-learning should be finished before practicing, but also let the students know these pre-learning tasks were to introduce the content to be learnt instead of to judge the outcome of learning.

When it comes to teachers, the evolving situation of the global pandemic shaped their working in a brand new at-home mode, which "even changed the flow of basic work entirely" (L Laoshi and Y Laoshi, Interview 2). The CTP group could predict that all the online shifts throughout the pandemic required teachers' efforts to design, plan, trial, and perfect their teaching plans, which might result in overwork and exhaustion of teachers instead of stimulating their enthusiasm. To adjust their working pattern accordingly ahead of time would be helpful for teachers' time management and anxiety control during this challenging time. Tighter collaboration was their consensus for work unloading and stress releasing, through which they could divide the tasks then collect their individual work and make it shared through online platforms. They were also able to keep track on each other's work and communicate if in trouble. Also important is the use of technological tools and online platforms. Teachers acknowledged that scanned workbook and other written assignments could be hard both for submission and for grading, so they tried to make good use of Atomic Assessment platform, and hey also intentionally tried various grading manners including using in-text annotation, side column, or grading criteria, through both computers and ipads. By developing their accustomed working and grading pattern, they improved their efficiency of daily work to make the most room for innovative ideas and try-outs in teaching.

However, frustration of not being able to teach as they were used to brought inevitable side effect in teachers' life, especially with the pressure of being both successful graduate students and language educators. L Laoshi, as an example, expressed her feeling of not living a fruitful and balanced life under social distancing time when she sometimes noticed she were unconsciously working 24/7. Such feeling was exaggerated when difficulties blocked their path for successful teaching such as students' unreadiness of in-class activities with insufficient pre-learning, less active in-class interactions, or students' complaints about the coursework without fully understanding the mechanism of their new course design. Y Laoshi also reported such feelings as "hitting on the cotton" when trying to set the same benchmark for students and carrying on their in-person teaching patterns in the online setting. All these negative feelings added on the struggles they were experiencing because of the teaching itself. The CTP group collaboratively looked for ways in which teachers can more efficiently support students specifically for the online semesters. The individual sections discuss above was their initial attempt to understand students' needs. However, big issue also came with the benefits. Normal arrangement of the office hours could not fit the number of students for individual meetings in the frequency of their expectation, so they needed to dedicate their off-work time for extra office hours, which was later not considered as a wise choice, as it was enforcing teachers' overwork. Similar situation that teachers might need to overwork in order to facilitate student learning was grading. By grading and using assignment comments as chances to communicate with students, Y Laoshi and L Laoshi, who took charge of the grading work, were hoping to provide individualized feedback for students to benefit from. However, considering the number of off-class tasks and exams , it was a huge amount of work if they grade every tasks in detail, and the outcome of students reading the comments did not match the efforts teachers put by submitting

written comments for interactive purpose. Discussion about how to balance student engagement and teacher workload was initiated during the winter break. Teachers no long expected themselves to grade tasks that can be self-evaluated through answer keys or check sheet. They would wisely use their newly integrated off-class activity of self-study, planning office hours during these sections, and boosted students' willing to ask questions when they did not need extra efforts to contact teachers via individual emails or other additional steps. The discord platform they started to develop in the second semester also fostered a communicative and supportive class community where students share the goods of their learning and ask for peer help if needed. These activities and platform use, while not specifically targeted at unloading teachers' work, redeemed their value, and released teachers' burden significantly.

J Laoshi, as the leader of the CTP group, once thought they need to "lower the expectation and accept that online semesters could be less productive", but reworded as "our goals could be reimagined and become more realistic based on the situation we face", as she and the CTP group gradually realized the strength and weakness of having all course design and classroom space virtually. They noticed that more focus could be put "on students' willingness to communicate rather than hardcore language points and skills" (J Laoshi, final reflection). Besides changing their mindset about online teaching being comparable to in-person, they started to realize that community bonding is important for their students and that could be an important feature that they could keep regardless of modality—encouraging students to communicate and help each other could be a win-win for both students and teachers. Additionally, the online semester made teachers to think about the working pattern they got used to, and challenge those unnecessary parts with less efficiency. Instead, it brought critical lens to teachers to evaluate and accordingly manage their work in relation with their personal lives.

6.2.8 Summary

During the online school year, members in the CTP group considered themselves as a team to make the shift from in-person teaching to online teaching smoothly. The idea of flipped classroom approach guided their overall modelling for course design and lesson planning, while responsiveness to students' specific learning needs ruled their revised model of learning facilitation practice. Technology integration was both the initiative and significant contextual element to be considered. As an initiative, it proposed possibilities for language education to be flexible, innovative, and user-friendly, by incorporating tools and methods that are not used in traditional in-person courses as frequently. As a contextual element, it hosted a series of alternated teaching and learning practice after teachers' critically considering how to make the most out of the current situation through new models of knowledge delivering, activity conducting, assessment performing, and care giving.

The CTP group came up with models for all 7 discussed aspects and revised them according to their practice. Most of the initial new models were proposed at the beginning of the school year based on the limited teaching online experiences as well as theoretical research and assumptions made beforehand by the CTP group led by J Laoshi. By redesigning the course from a big picture course planning to details such us specific teaching material and activities, the CTP group essentially rehearsed for a semester-long learning of their expectation starting with weekly pre-learning and comprehension checking activities, followed by synchronous classroom practices and post-learning interactive tasks, then some extensive learning reflection and bi-weekly check-in with teachers, and lastly reviewing and assessments to facilitate learning for communicative purpose. Their testing of the initial models revealed that the ideal learning

process was unlikely to be achieved with the students not accustomed to the reality of overall situation of working under social distancing, and as a result, the changed flow of learning. The launching of more practical models were outcomes of teachers' collaborative thinking, actively responding towards the students' learning needs and the evolving contextual situation. The remodeling process not only invited teachers to better understand technology-integrated teaching in terms of what it was capable/incapable for, but also raised awareness about the consequentially changed characteristics of Chinese language learning. What's more, it was indicated that in the revision process of the activities and assessments design considering the pros and cons of virtual platforms, instructors started to actively pay attention to, thus were more sensitive and more considerate about students' needs and their feedbacks.

After collective efforts modeling and remodeling their technology-integrated Chinese language teaching, instructors in the CTP group gradually acquired the essence of practicing flipped classroom in an online setting. Thanks to the shift from in-person to online classroom, they managed to disturb the accustomed learning cycle of starting with limited or no pre-learning, and emphasizing the post-learning activities/review. Through this process of exploration, instructors also further developed their understandings of flipped classroom as well as the communicative purpose of the learning activities. This has proposed a possibility for their future language teaching that innovative teaching can be conducted during the time of change, and it is likely that instructors and students could take the challenges as opportunities better. In next chapter, individual instructors' cognitive development towards technology integrated Chinese language education along their journey of collaborative teaching preparation is studied.

7 Teachers' perception of language teaching with technology integration

Being a PhD majoring in Chinese in the US university indicated that teaching a language course could be one of their future career choices. During the year of online-only teaching and learning, instructors not only worked in a team to put together the course they tried to teach, but also developed themselves as university language course instructors. Besides some shared elements of professional developments among the team, each instructor has their own uptakes about what they learnt and how they perfected themselves as university language instructors. In this chapter presents how the studied group of Chinese language instructors perceived their professional learning journeys during the year, especially in terms of the technology integration trials they made. For each instructor in the CTP group, the inquiry ranged from the professional growth as a technologically competent language educator, changing attitude and beliefs towards technology use in language teaching, and their self-reflection experiencing this journey.

Forms of professional knowledge about technology-integrated language teaching can be explained through T-PACK framework introduced in section 2.3.2. The aspects of professional growth include how to work with softwares and platforms in order to deliver knowledge, how to react to the changes brought by the technology use, and how could those to serve the goal of their teaching in that specific course. Teachers' belief of technology use in language classrooms changes longitudinally, the process being relevant to their personal and professional routes. Also, individual experiences in the course preparation, class practice, as well as communication made in Chinese teaching and learning community shaped unique professional learning trajectories for each instructor. Interview data of the three instructors have presented the process of their digital competence growth as well as their evolved teacher cognition in relation to technology integration. In these following sections, the voice of each participating instructor of the CTP group is being heard invididually, starting from J Laoshi, who was the leader of the instructional

team.

7.1 J Laoshi

7.1.1 Professional growth as language educator

J Laoshi was leader of the studied instructional team, and she was the only CTP group member who had been teaching virtual language course in the previous half semester teaching Second Grade Chinese virtually right before the studied school year. Her learning about technology-integrated language teaching during this school year started from considering the amendments needed for this online school year by reflecting on previous experiences and trying to make new school year decisions how could she optimize students' learning experiences better than the last semester. Her journey of accommodating technology into Chinese language teaching initiated before CTP group activity started, but the CTP group has been the main unit where professional growth took place.

In terms of the knowledge about the use of technological tools and platforms, J Laoshi believed that despite of her confidence of applying it in practice, the major growth landed on her comfort level using those, the extent of understanding how these platforms impacted teaching and learning, and how to embrace positive impacts while preventing negative ones. Canvas and Zoom being the two inescapable elements that the CTP team needed to accommodate under the condition of global pandemic and the consequent institutional decision of all online courses, J Laoshi did not have more choices available but the opportunities to embrace the change and to learn how to effectively incorporate them in the course design. Her learning happened through workshops, experience shared among language teachers in the larger Chinese language program, voice from current and previous students learning languages, reflective thoughts generated

through observing teaching practice of CTP group members, and other minor discursive learning moments (e.g. browsing education-related information through social media and other websites). Although she attended quite a few seminars and workshops offered independently online or by her department, those sections were regarded as informational but over-generalized, or not specifically for language instructors in universities. More practical advice of how to locate teaching in these platforms were introduced to her by previous teachers with abundant teaching experiences using those, or through collaborative exploration and rehearsal about a specific function of the during teacher meetings among the CTP group members. When it comes to specific technological tools that were applicable in their course design, J Laoshi noticed significant develop of technological skills in course material preparation. This included the regular use of Google online sync/editing/share tool kits—the equivalent of Microsoft office during their collaboration preparing for course documents, Kaltura—the multimedia preparing tool for canvas-based off-class activities, Atomic Asseessment—the interactive assessment tool used in pre-learning activities, Quicktime--the video player for asynchronous lecture recording and producing, iMovie and Arctime Pro--the video editing and subtitle production tools for dubbing activities and other video resources, as well as the familiarity of platforms such as kahoot!, pinterest, flipgrid, etc. After being introduced to all these tools, J Laoshi noticed that she only kept using, and then be good at a few of them which were being frequently used. She also found herself more engaged in developing skills of these specific ones by self- and group-exploration. As she was in full charge of lecture video preparation, she leads the CTP group learning of how to make screen recording and voiceover. On the other hand, the captioning and subtitle production being not on her regular to-do list, she gradually lost the proficiency using the tools, and needed to refer to the tutorial section profiles if she needed to do that again.

Kaltura and Atomic Assessment being the “official choice” for multimedia integration, some university-wise and department-wise teacher training sections provided J Laoshi with fundamental knowledge about them. She also benefited from CTP group’s mutual exploratory learning and troubleshooting during the CTP group meetings. Using QuickTime to help recording the lectures has been introduced to J Laoshi when she talked to experienced teacher, and mastery of it relied on J Laoshi’s independent exploration through watching open-source videos. As she was the only person who led the lecture videos preparation and had to do self-recording at times, the use of QuickTime, while not brought up for group discussion during the teacher meetings a lot, was intensively explored by her. She also talked with the researcher/technology specialist individually at times during interviews and pre-/post-group meeting times in order to confirm some details how to efficiently accomplish the recording work.

Beyond making lecture videos, J Laoshi also saw herself developing her professional skills using Google tool kits (Google Folders/Docs/Slides/Forms). These, although being familiar enough for J Laoshi as the go-to kit for group projects at school and at work, were still worth further exploring. Making slides, presenting documents, and sharing folders were by no means new for anyone in the CTP group, but J Laoshi claimed that her previous experiences making and using google-based course material in face-to-face classrooms were not fully duplicatable into the online language classroom setting. Teaching preparation attempts among the CTP group has been exceptionally helpful, and J Laoshi was leading their attempts to mind every of their steps adding, editing and presenting those course materials, especially in terms of how to make the information not only accessible but also digestible for most of the students under the current circumstances. The CTP group shared ownership of a google drive folder for the course, in which they put their self-composed course material as well as collected resources available to

use. The folder was especially well-organized so that it would cost less time for instructors to navigate through the co-constructed folder, especially during this work-from-home time, during which instructors no longer share same working space and time to sit together and check in with each other. In terms of producing self-composed course materials, J Laoshi clarified that among all the google tools, apart from a couple of registration and class maintenance documents that were based on google forms and google sheets, the instructional team members mostly found themselves working with google slides regularly. As she was not in charge of composing the slides but to proofread and edit those, J Laoshi drew real-time lessons about how to prepare course material from student reactions in classrooms of hers, as well as her observation of the others' in their CTP group. Aspects that has been noticed by her and brought up to their CTP group meetings included (1) simple and clear layout (2) illustrations in pictures and English explanations (3) amount of information per page (4) amount of written down information to supplement teachers' demonstration of knowledge and activities. J Laoshi felt the CTP group members and herself developed a sense of what is a well-designed slides set for their classes through CTP, but she found it hard to verbalize that as a standard to be followed in future Chinese online courses because the most part of it was context-specific and vague. In addition, J Laoshi believed she advanced her skills using google tools by absorbing the timesaving and efficiency-improving tips and tricks discovered and shared among the team—including formatting, commenting, documents embedding, and privacy options. It was "surprising and eye-opening" *(J Laoshi, Interview 3)* to find out the functions that none of the teachers was aware of before, and she believed there must be more potentials to better utilize the google series as educational tools.

When technology use is combined with content knowledge and its delivery, J Laoshi

reflected on how technology would impact the Chinese language being taught throughout this school year. When initiating and perfecting activities that engaged other native Chinese speakers in their practice or incorporated authentic materials, J Laoshi realized that languages that are widely accepted and frequently used on technological-friendly media and platforms could be more current and practical in contemporary daily life compared with those in pre-written textbooks that might be outdated. For example, in their chosen course material of out-of-textbook video dialogues and TV drama, J Laoshi grasped the technological content knowledge (TCK) that "the language patterns presented by the interlocutors were more applicable in the technology era" *(J Laoshi, Interview 2),* which could be divorced from what the textbook showed. This included vocabularies, phrases and idioms, grammatical patterns, as well as pragmatic feature of language use such as speed and tones. She also mentioned that during the off-class activity of "dialogues with Chinese student teachers of Mandarin", these youngsters' discussion about the weekly topics were leaning towards the direction that young adults could better relate, using the language that were more "fashionable" than textbooks *(J Laoshi, Interview 4)*. This was considered an important reason why this specific activity was spoken highly of by the students. It was discovered that although J Laoshi and her colleagues would have a general sense of the gap among the textbook language, daily use language, and language used in digital platforms, it was not until this year that such awareness was gradually put together systematically in order to support their clarification to the students about their contextual appropriateness. This reminded her that Chinese language educators should be aware of the technological content knowledge of "fashionable", "technology era" language and how this compared with the textbook version, as well as the information gap that students might face to in order to master the appropriate language in each context. This was considered as a core

requirement if these alternative language patterns were brought up in innovative activities, and teachers should be prepared to introduce those to students ahead of time.

Upon realizing the importance of TCK, the one step forward on language instructors' mission was about how content knowledge could look student-friendly when presented through technology, especially when student learning could be very different being online from what it used to be in-person. Such set of technological pedagogical content knowledge was acquired by the instructional team through collaborative efforts. One of the productive approaches for teachers preparation was believed to be getting themselves to clarify those complicated language points in a practical way that was specifically narrowed down for the given context instead of a non-specified full version during the course material preparation stage. J Laoshi noticed through observation of multiple classrooms that it could be more productive if students were provided more deductive, straightforward information to grasp--especially when the language patterns were complicated, or were something that could cause misunderstandings through learners' language transfers[8]. She explicitly mentioned multiple times *(J Laoshi, Interview 3, Interview 5, Reflection)* that it might be a non-desirable learning path that task-based teaching believers would not prefer, but this had been the reality of their curriculum and classrooms in practice. When preparing the supplement class materials and PowerPoints used in their online synchronous discussion sections, she would make sure teachers were well-prepared to explain the target language pattern in reference to the contexts that students could relate, and provide examples appropriate for that specific context in discussion. Also, technological pedagogical content knowledge (TPCK) is the foundation of teachers' pedagogical choices in terms of

[8] Language transfer, as defined in, is the influence resulting from similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired

planning activities and conduct interactions among teachers and students. This was especially critical for J Laoshi at her position of instructional team leader and course planning decision-maker, and she gradually developed her TPCK to lead this specific course through CTP and to make wise choices of what moves should be made. For example, in Interview 2, she mentioned that hunting for grammar videos, through either online open-source platforms or shared videos by colleagues and previous co-workers, required her to be specific about what content should be introduced to the students, and whether an educational turn was made to make that piece of content accessible enough for students to absorb in an asynchronous online lecture setting, and to get it ready to be applied in the practice during discussion sessions and off-class activities. J Laoshi also actively shared her thoughts within the CTP group about how to be selective when incorporating activities and the materials pre-prepared in some of the innovative technological platforms (such as Kahoot!). She learnt this from her own practice trying some pre-made tasks, finding that students in their college years should absorb language knowledges better when they are provided quick and easy interactive tasks, but not complicated gaming sections that could be fun but time-consuming. After a school year making pedagogical decisions what activity should be the most efficient with specific student group for specific target knowledge, J Laoshi considered all members of the instructional team, including herself, capable of evaluate the feasibility of innovative in-class and off-class activities in practice with few off-target attempts.

This, as an important competence owned by a language instructor, were not merely about what content was being taught. Besides language-related knowledge that influences decisions about practice in virtual classrooms, the instructors in the CTP group also acquire pedagogical knowledge that are relevant to technology use. J Laoshi noticed that she and the instructional team were picking up technological pedagogical knowledge gradually along the school year

through coming across challenges in teaching and reflecting on those. Her take-aways ranged from classroom management to content delivery in an online classroom setting. In terms of classroom management, J Laoshi saw herself developing a critical sense of how technology integration would impact on the strategies and methods to monitor the class and communicate to students. For example, through the observation of instructors in their CTP group, she noticed that some of the questions being asked in the class as triggers of group activities were not understood by all the students, and the teachers might not be able to identify the problem with limited real-time interactions with students, including reading students' facial impression and body language when talking to them. This, as mentioned in CTP group discussion about in-classroom pedagogy, was considered as a limitation of teaching a language course virtually. In some extreme occasions, instructors even could not see students' hands-up to ask for clarification in time. The issues of comprehension check in virtual classrooms were being exaggerated even more because a small group of students that were comparatively slow in the class were not able to get help from peers when indivudally talking to the student sitting beside were not an option anymore. According to such observation, J Laoshi was able to develop her understanding of effective comprehension check especially through online platforms, as well as the importance of making "comprehensible input (Input Hypothesis[9]) in the way of tearing apart a whole piece of information to be understood into small pieces to make comprehension process smoother" *(J Laoshi, Interview 3)*. In terms of content delivery, J laoshi developed her understandings and perspectives towards incorporating technology-supported tools as pedagogical helper to deliver knowledge, which used to be suspicious for her in her previous in-person teaching experience.

[9] Input hypothesis (Krashen, 1992), states that people acquire language by understanding messages, and the messages that are considered comprehensible input would be efficient in improving proficiency.

She considered herself with a conservative mind, assuming the application of technology could be time-consuming while not necessarily leading to significant positive outcomes. She admitted that she did develop such stereotypical assumption from previous teaching experiences of trying tools such as Kahoot and Quizlet live activities in her in in-person classrooms when it took her class around 5 minutes only to switch students' set-ups from "focusing on the teacher" to "looking at the digital platform on screen", even just to get connected online. She was glad that she was open-minded enough to give those a try in virtual classrooms again, and found those more functional than expected. These activities were especially helpful to keep students' focus during the online classroom settings, which was one of the biggest challenges identified by their CTP group.

> *"Students are not adult-like enough than I expected—I was assuming they would not need those games in class to keep focused, but it turns out that with a well-planned design, these activities do make them excited, and sometimes simply energize them up during class if they felt bored from the repetitive exercises. We just need to make it easier to operate." – J Laoshi, Interview 2*

What she realized during these technological pedagogical attempts became source for some minor real-time decision in classrooms about what were the best ways to let students acquire the knowledge they try to deliver, and to guarantee that would happen successfully. During this process, being able to fill in the communication gap between teachers and students in the virtual environment and enhance mutual understanding were challenging her and the instructional team constantly. For example, she noticed that "being drama" (meaning to use fluctuating tones and exaggerated ways of impressions just like performing artists) could also be really helpful as an icebreaker if the atmosphere in the virtual classroom was "too calm" *(J Laoshi, Interview 2).*

This could be achieved not only by using her voice, but also using some built-in functions of their virtual meeting platforms to make interactions such as showing clapping hands or confusing face. At the same time, she learnt from students' feedback that sometimes her reactions of students' performance in class could be make them nervous, and at times "frustrated", especially when they were not sure about their answers for the questions she brought up (J Laoshi, Interview 4). She kept looking for the balance what could be the most natural and comfortable manner to keep the interaction flow through a video conferencing platform.

Another challenge that stimulated J Laoshi's learning was that most of the time she could not finish the activities as designed because it always took more time than expected to ensure all details of the activities were clearly explained to, and understood by all students. She explored different forms of activity instruction models and ways in which students could speak up and ask questions. In the CTP group meetings, she managed to put together a set of teacher-students and students-students Zoom communication etiquette she cultivated including using microphone, cameras, emojis and chat box. This was able to circulate and get consolidated across all the sections because of the rotate teaching design. Although some of those were genuine, it was still helpful for all the teachers and students to share the same manner of communication and feel comfortable interacting with each other in a mutually understandable way, especially in the language classroom where communication was the expected outcome.

7.1.2 Attitude

In terms of the attitude towards online language teaching, J Laoshi's thoughts were gradually developed throughout the school year. During the first interview before the school year started, she expressed an overall negative impression about teaching and learning online at the beginning

of the online school year, especially when comparing to in-person classrooms. Incomprehensive interaction, low efficiency in information exchanging, and imbalance between teacher investment and learning outcome are the three reasons that caused her initial impression. Firstly, she firmly believed language learning benefited from in-person interactions among teachers and students, as the features of language were not only the verbal part, but also the gestures, facial expressions, emotions, and implicit messages that could not be conveyed remotely. Also, virtual classroom space could not mimic the in-person small talk that occurred before and after the class starts or random talks in the hallway, which could make it more challenging to build a learning community that encouraged Chinese language learning outside formal classrooms. Secondly, the class not being face-to-face has narrowed down forms of activities that could be conducted. J Laoshi felt her thoughts and intensions were less easy to be understood by students, so she might need to slow down the pace and skip some course contents that were interesting but not core. Thirdly, although technology integration was not a new concept for her and fellow teachers in the CTP group, it still took time and efforts to get themselves technologically competent to fluently use technology while teaching. Designing activities and conducting those smoothly required teachers to invest a lot of time and efforts, which escalated their expectation what benefits their efforts could bring. J Laoshi was not willing to dedicate a big chunk of teaching preparation time exploring new tools and activities that does not have foreseeably game-changing outcome. Throughout the school year, the negative impression was changed gradually.

Although some of her concerns still remained, as the school year went on, J Laoshi discovered positive aspects of technology integration in the language classroom that is not duplicatable in in-person language classrooms. One of her major renovations of shifting in-person class to online is to break the accustomed cycle of student learning starting from the

lecture without preview. It could be hard to push students to change their everlasting habit to do preview at home, and there used to be no mechanism for teachers to monitor or evaluate that. Other benefits that she expressed in her reflection includes opportunities to test out more multimedia-based content. Her observation was that those contents were considered complimentary previously in face-to-face course design, and when teachers presented those in classroom, students were likely to treat those as a break time for fun instead of a fruitful learning moment with care. This could also because teachers' recognition of non-traditional content was relatively less, and they were not strategic enough when choosing what to present to students and what would be the goals to apply these contents. Online classroom essentialized these non-traditional contents and urged teachers to become technologically competent to build up their curriculum and prepare for the class properly. Through their trials of technology-integrated teaching materials and pedagogy, J Laoshi noticed the developed alternatives that the instructional team would never think about if these instructors did not experience an online school year. She believed that this could be fundamental even if their classes return to in-person ones and would definitely benefit students' language learning regardless of the modality of classes.

7.1.3 Pains and gains

Being able to experience teaching language fully online has really been a journey for J Laoshi. As a teacher who already got used to teach language courses in the comfort zone, she considered her major challenge to be changes. as being both technically and mentally prepared for the changes and explorations that she might go through. For one thing, the shifted form of instruction deconstructed the working habits that had been well-established for in-person

courses, and this was the most "scary" and "unwilling" part of technology-integrated teaching *(J Laoshi, Interview 2)*. The uncertainty required courage to deny what the teaching team previously had. For other, the shifted nature of classes required an updated set of content, materials, lesson plans, and ways of student-teacher communication. Everything, from the general expectation of the school year to specific details of a class activity, was open for further adjustments. The amount of workplace learning needed for the developing mode of instruction required more time and efforts dedicated to technology-related elements.

Thankfully, the gains of the online school year and the implementation of technology-integrated teaching were regarded by J Laoshi as fruitful and meaningful. For one thing, the shifted nature of the course instruction has developed her thinking about the potential of language course design in general by offering alternatives of what it previous was. J Laoshi considered flipped classroom, intensive media use, and digital community building as some major take-aways from their during-pandemic teaching that could be extended to post-pandemic era for Chinese language courses, or even other language courses to incorporate. For another, J Laoshi realized that her digital competence has been upgraded with the incorporation of technology elements, including technology-related teacher knowledge supporting the process of teaching planning and practice, and general digital literacy skills applicable in teaching as well as relevant personal and professional life. Those, although did not sound new for J Laoshi, still experienced a tremendous growth that would be consciously incorporated in her future life and considered critically important in contemporary society. In addition, J Laoshi was thankful that the CTP group she was a part of offered community learning opportunities and mental supports facing all the changes and challenges during the time of uncertainty.

7.2 L Laoshi

7.2.1 Professional growth as language educator

Being a first-time language instructor during the online school year was nowhere near easy for L Laoshi. It challenged her to not only get familiar with the teaching mechanism of a language course, but also master the features of technology integration teaching at the same time. She noticed her professional development gradually with the accumulation of experience.

In terms of being a technologically competent language instructor, L Laoshi considered herself as a newcomer, and she reported an intensive learning experience of technological knowledge (TK) during the studied school year. Although previously used Canvas as a student and as teaching assistant, this was the first time she needed to base most of the course contents in a variety of tools available on Canvas. She started learning those from the department-level and college-level teacher assistant trainings/workshops, which provided general information and demonstrations about what could be accomplished through Canvas. In CTP meetings and daily communication within the CTP group, contextualization of those general information about teaching platforms into specifically Chinese language education was in a “trouble-shooting manner”, which matched with L Laoshi’s expectation of their CTP group as a “safe space to ask and discuss about any questions we come across at our earliest convenience”. CTP group members were able to provide in-time and in-detail feedback on technological issues which were specifically related to their own course design, especially when L Laoshi was experiencing some difficulties that they had previously come across. For example, at the beginning of the school year, making canvas atomic assessment tasks was unfamiliar to her. Although TA training she attended before her teaching started introduced the basics of how do use atomic assessment to her, she still had very limited hands-on experience of using it. As it was the major platform for

pre-learning activities of their course, L Laoshi felt the pressure to acquire how to skillfully use it as quickly as possible. She managed to learn how to make language course tasks (e.g. how to make pop-up questions; how to insert timed questions; how to embed audio into questions) with the help of the CTP group members during the weekly meeting, and was able to fluently use it (e.g. understanding when in a monologue would be a good place to pause and insert questions; how to vary the forms of weekly tasks; how to make optimized sized audio material for a task) through her own practice.

Also new for her was the PowerPoint/Google slides preparation for language teaching purpose, as her previous teaching experiences of university level literature courses had never relied on slides to present course and deliver knowledge this heavily. She noticed that unlike other content course she taught before in which slides or other forms of in-class content presentation were less essential, language courses, at least the ones in their Chinese language program, took content delivery through slides more seriously and critically, since both the form and the meaning of language should be the learning object, and teachers relied on the slides to present these language points in a written form *(L Laoshi, Interview 2)*. Upon noticing details could make big differences, L Laoshi carefully looked into the samples of previous teachers and talked to her peer teachers in the CTP group in order to equip herself with knowledge about how to make language course slides work efficiently (e.g. font size selection for different types of information; using animation to layer the information being presented; adding English to help understanding;). From the collaborative Google slides making process, L Laoshi consolidated her observation of the previously-made slides by experienced teachers, and also learnt more details that are practically meaningful. For instance, she learnt about the effectiveness of bullet points when explaining language knowledge or making activity instructions, as they were

information-intensive enough to help students highlight the core of a long sentence or paragraph. Also, she and the instructional team realized when going through the language points, it could be important to include the patterns in specific, but it could cause the dependency of students on those formula-like patterns if they can still see patterns in communicative practice. She initiated the slide-sharing mode of collaboration where the instructional team share their slides preparation so that they could get feedback from others to further improve. L Laoshi also invited other colleagues to observe her classes, and she was happy to let her teaching be used as sample for discussion in the CTP meetings. This triggered J Laoshi's finding about the issues and potential improvements of Google slides preparation to be more friendly for use in class (see section 7.1.1). The discussion and troubleshooting during CTP group meetings and their after-meeting check-ups not only perfected the google slides produced by L Laoshi, but also explained to her what would be considered as efficient teaching materials for online language course content presentation.

Technology modified not only the ways how the language was being taught, but also how the language was constructed. Apart from her familiarization of the TK of digital teaching platform to prepare course materials, L Laoshi also felt the need to perfect her content knowledge to be technologically and pedagogically friendly (developing TCK, PCK, TPCK) for teaching an online language course, as the content knowledge that was technology-friendly appeared different from her previous knowledge of general Chinese linguistic or theoretical Chinese language pedagogy. L Laoshi mentioned that it was the researcher's assumption during one CTP meeting that for a certain group of Chinese language learners, handwriting could be a core literacy skill no more in the future, as typing could be the substitute for handwriting in terms of documenting and transmitting information. As a novice teacher who was not a loyal subscriber

of the traditional belief in the importance of handwriting, L Laoshi expressed her observation of the need to infuse new language and literacy skills of the digital age to language classrooms, especially after reflecting on students' hesitation to enroll in language courses. She believed there is a reason behind reconsidering the weight of Chinese character handwriting and the add-in of authentic multi-media content in their course, which would potentially make fundamental change to how the course would be arranged. Also from students' feedback, L Laoshi noticed during the first half of fall semester that some contents she was trying to deliver were too complicated for them to understand, which could result in some common mistakes in students' homework and assessments. This, as she learnt from other CTP group member, was not because the language points were beyond students' level of acceptance, but that the attempt of providing all-inclusive knowledge collection about this language point could put students under pressure. Although it was a good attempt to show students the entire big picture of how their target language could possibility work, those accurate, lengthy, and complex explanation of those language points could hardly be processed by the students. What was helpful for their current level of language learning would be those straightforward, segmentary, and simple illustrations of languages points which would only be related to the context introduced in that specific lesson. After being observed, she was also reminded by CTP group members that it could be more efficient if the content knowledge could be paired with more examples and body language on top of those simplified illustrations that is not as complicated to comprehend.

While renewing her content knowledge, L Laoshi was gradually accumulating TPK about how to make the knowledge delivery more smoothly in virtual classrooms. Teacher talk was her first "issue" that was pointed out by other teachers in the CTP group when they observed her class. L Laoshi was reminded by almost all the teachers that the teacher talk she made when

teaching needed to be “reduced”. Here the reduction refers to both amount and speed. Upon feeling that students might not react as directly as teachers were used to in face-to-face sections, she agreed with other teachers’ suggestion that teachers should be reluctant from providing constant information, but deliver smaller amount of core information and leave some blank time for the provided information to be processed. L Laoshi noticed that she could “easily fall into the cycle of providing explanation with overloaded information that led to students’ confusion” *(L Laoshi, Interview 3),* for which further explanation was needed. Not only did she feel her use of long sentences could be unnecessary, her speed of talking in Chinese in classroom could be out of control if she was trying to clarify a relatively complicated idea. This applied to both content knowledge delivery and activity instructions, especially when students responded with her teacher talk with silence.

> *“Sometimes I would feel worried when I don’t hear back from students, or just be afraid to leave silence in the meeting section. Especially when class is online and it is hard to detect their reactions, I am eager to fill the silence up with words, which actually could be their processing time and needs to be left blank. This is something that I realized and tried to fix badly, and that had been a major challenge for my teaching for quite a while” –L Laoshi, Interview 3*

As the interaction among teachers and students felt indirect through online platform, teachers might slow down talking and allow extra time for students to digest the information and reflect on what have been learnt—this is the ‘speed’ part that L Laoshi saw herself adjusting. Slowing down the pace when talking in Chinese could be helpful to allow enough student processing time. This was not an easy task for L Laoshi since talking slowly was “different from everyday life habit” (L Laoshi, interview 2). She noticed that although being reminded to use

word-by-word speed without connected speech when speaking Chinese to students, she was too used to her regular speed of talking to adjust that to a low pace. It could be harder for online courses, as teachers would feel like talking to the screen, which could make them fall in the "talking-on-my-own" mode and speed up unconsciously. Besides always trying to control the speed, L Laoshi also practiced as other teachers suggested to fully pronounce the vowels in each word, which potentially helped her to sound clearer instead of linking the words together.

Limiting teacher talk can also be part of the solution of student-responsive teaching. It was brought to L Laoshi's attention by CTP group members that teacher talk could easily dominate the online classroom as the dynamic of big group online video conferencing had to be one-person talking. L Laoshi noticed from her previous experiences meeting via virtual conferenceing softwares that although he/she could be interrupted by emojis (e.g. students' hands-up, clapping hands, etc) and chatbox messages, the host could easily dominate the entire talking time, not only by lecturing prepared content but also responding to the questions it was still hard for the talking person to naturally respond to the listeners/students. When this comes to a novice language teacher who was sensitive and sharply reacted to student questions, L Laoshi was made aware that she tended to provide immediate response to the questions students brought up and tried her best to use those as opportunities to teach or review the language points, which sometimes became information overload for students. She also recalled times when she was "in a hurry to explain" (*L Laoshi, Interview 4*), and did not grasp students' question precisely, thus provided a lengthy explanation of all the aspects in general. Students' feedback and peer teachers' observation comments proposed alternative approaches to ask for specification and elicit more about what students' questions specifically are, thus provided on-point information instead of over-lecturing unnecessary details.

Reflecting on her learning-to-teach-Chinese experience during the year of technology-integrated teaching, L Laoshi regarded it as "a journey to learn a new well-planned series of teaching behavior*" (L Laoshi, Interview 5).* Everything could be strategical—let it be what should and should not be mentioned while teaching, how information should be presented, and how all classroom participants should interact with each other. More knowledge and experiences in teaching would trigger more genuinely appropriate moves in response to the situation taking place during teaching.

7.2.2 Attitude

Having little previous experiences with language teaching made L Laoshi a "slow starter" in teaching preparation, as she needed to understand how the language course normally ran, and accordingly, what should be the focus of teaching preparation work. These took her extra time and energy beyond preparing for technology integration, and was in her later reflection portrayed as a stress reaction towards the new teaching experience. At the beginning of the school year, L Laoshi was "drained out by preparing and teaching the course of a new genre" (*L Laoshi, After-meeting talk, Sep 25th*) and developed a negative first impression towards online teaching. Such attitude also stemmed from the exhaustion of extra efforts towards technical issues and the insecure feeling of lacking personal connection between the students and herself. In terms of technical issues, L Laoshi identified some drawbacks and confusions that using online teaching platforms caused being a first timer user *(L Laoshi, Interview 2)*. She explained this using the grading tool on canvas, SpeedGrader, as an example. SpeedGrader was not convenient enough to meet the need of language instructors especially when it comes to make comments and in-text annotation for handwriting assignments, since the assignment were always submitted as scanned

pictures or photos of the handwritten work. Also, some multimedia materials production work, while benefited their teaching to a large extent, could be time consuming and exhausting. L Laoshi mentioned that teachers need to "spend a lot of time" and "put extra effort"(*L Laoshi, Interview 2*) to make those technology-integrated teaching materials even though she did not express a negative attitude towards it explicitly. In terms of lacking personal connection with students, L Laoshi expressed her frustration struggling from not being able to communicate with the students as she used to be able to. She was hoping she could be able to get real-time feedback from students' reaction of the class to confirm she was working on a correct track, especially when she did not feel fully confident about her instruction as a first-time language instructor. However, the online classroom setting made students come and go into the virtual environment without more opportunities to talk individually before and after class. Also frustrated was the reality that she could not read how students think when in the class since the virtual classroom platform could put very few students on display when instructor share their slides in the screen sharing mode. As the school year proceeded, while she was not capable of fundamental changes how the course platforms and course plan could work, she developed her own minor strategies, including providing annotated assignment comments and wisely use office hours to provide detailed feedback to students.

After several weeks when technical issues were no longer the major concern of L Laoshi and the instructional team, technology use in language teaching redeemed more values, especially under the social context where interpersonal communication made in a virtual form was widely recognized and accepted. L Laoshi found herself in a more favorable position where she was able to comfortably apply technological tools into her teaching and communicating process, and gradually felt confident about it. She believed pre-learning activities with the help of

technological tools became more efficient and easier to be evaluated, which at least made sure students were actively engaged rather than just skipping this process. On the other hand, she still held a skeptical attitude towards online synchronous discussion sections, since she would picture a better interaction with students if they were sitting face-to-face in the classroom with active in-person monitoring of their in-class activities and practices—although she did not actually have such experience teaching those in-person language courses.

By the end of the online school year, L Laoshi regarded herself as a frequent user of most of the technological tools used in their teaching preparation, especially those related to make google slides, atomic assessment activities, and video materials for dubbing. These technological tools and technology-based course materials were believed to be helpful for language teaching of all modalities.

> *"I could picture myself consulting to these later on when preparing or teaching other courses, let it be another language course or a content course, because even if we give classes in-person, these materials and the relevant activities we do using these materials would make my class more interactive and…basically more lovely." (L Laoshi, Interview 5)*

She also considered herself being capable giving class and interact with students even if they did not manage to be present in the same in-person classroom space. This, while being possible to achieve a fair outcome, was regarded as less desirable compared with in-person classroom settings where she could face to the students, read their thoughts from their facial expressions, and respond to their questions in time.

7.2.3 Pains and gains

As mentioned in 7.2.1, being a first timer teacher of a language course during the online school year was not an easy task for L Laoshi, and she was clearly stressed out at the beginning. Working on teaching and teaching preparation occupied most of her weekday time, making her lose the balance of work, study and life. She was not hesitating to express her frustration during the interview towards both the questionable unspoken rule that teachers may need to keep students satisfied and the burden of being a technologically competent teacher during the online school year. It was challenging both physically and mentally considering the already heavy workload recognized by the CTP group and the technology integration as an add-on.

Such pains brought by the online language teaching experience called for teachers' collaboration that not only offered partnership but also companionship among CTP members. This has been regarded as one of the main gains throughout this whole time by L Laoshi, as she not only accumulated her start-up experiences being a technologically competent language educator, but also friendship and a sense of belonging in this teacher community. L Laoshi was especially thankful for this model of collaborative teaching preparation, as her previous experiences teaching other university-level content courses had not witness this high level of collaboration in which there was no such thing of "my section" or "yours", but "ours". The spirit of caring and sharing really encouraged her professional growth as a novice language educator and empowered her to actively play her part in running the course rather than holding back from realizing her values.

When it comes to the gains of teaching profession, L Laoshi enjoyed the time spent on learning new technology and digital literacy skills needed as a new era language educator. Using multimedia softwares was something new and beyond expectation for her to learn, as she was assuming they would use prepared materials for teaching instead of making their own. But this

experience of producing multimedia course materials opened her mind about creative teaching preparation by enhancing her confidence of being capable making her own. Also improved was her familiarity of establishing an online course based on an online teaching platform. She realized her critical thinking about the university language courses as well as their online versions had been developed through participating in the CTP group discussion about designing and building up the course. As a CTP group member that was less experienced in teaching a Chinese language course, L Laoshi was aware that instead of having the chance to make curriculum and course planning decision in relation to flipped classroom approach with the technology-related factors into consideration, her experience during this school year was more about day-to-day lesson planning, material preparing, and teaching. Her take-aways from the flipped classroom course design was more about how to encourage students' out-of-classroom learning and strategies to keep them engaged in virtual classroom settings.

> "*Teaching Chinese is not only telling whatever Chinese-related knowledge to the students—it actually does not work in the way. Esepcially through the online classroom settings that exaggerate the communication problem, I am made more aware that for teachers it is more important to observe and listen than to speak. Creating the sharing and caring learning atmosphere would be of same if not more importance than telling them the knowledge." (L Laoshi, interview 5)*

More actively reflected during the group collaboration were detailed lesson plans and teaching practices conducted by individual teachers, which was, as she considered, the most helpful and contextualized teacher learning moment of pedagogy-related teacher knowledge (PK, PCK, TPK, TPCK), technology integration being a crucial part.

Meaningfully, possibilities applying technology into future Chinese language teaching to

create a more comprehensive teaching and learning experience were acknowledged and highly appreciated by L Laoshi. She also extended her career route by teaching online language course. She expressed her confidence being able to lead a fully online course thanks to all the exploration that this CTP group did on online teaching platforms. She also considered being a language instructor in university a potential future career path, both Chinese and English being two possibilities. She believed although she was not an expert in either Chinese linguistics or English linguistics, she could critically utilize her knowledge and proficiency level in those languages, self-direct her learning of relevant teacher knowledge if needed, and exchange ideas with colleagues in her teaching team or teachers in their collaborative community.

7.3 Y Laoshi

7.3.1 Professional growth as language educator

Similar to J Laoshi and L Laoshi, Y Laoshi agreed that this online school year witnessed her development professionally as a university language instructor. With teaching experience in the same position of Teaching Assistant in a university language course previously, the process of teaching preparation did not feel unfamiliar to her. Compared with J Laoshi and L Laoshi, who were first-timers in their position of Lecturer and Teaching Assistant respectively, she reported less anxiety as a second-timer in her position. Nevertheless, she understood that her professional knowledge still needed perfecting when the online school year started with the upgraded intensity of technology use and the changing modality of class. Y Laoshi experienced, and clearly noticed her growth on her professional knowledge from the teaching preparation.

In terms of using technology tools and platforms, getting in touch with technology-intensive course material preparation, especially multimedia material production, was one of the important

moments of professional learning for Y Laoshi. With the positionality and experience of returning language TA, she reported her critical observation about using Canvas as the major teaching platform. On the one hand, she noticed her growing awareness and skills running an online course through canvas as the main platform, in which a lot of necessary functions and tools were embedded. Many of these features were briefly introduced to her in general teacher training workshops provided by the university during or even before the online school year, but Y Laoshi found those trainings too general to support their specific teaching needs as language instructors. Most details of the platform use related to language course teaching were explored and confirmed during CTP group meetings. Y Laoshi provided an example of learning about the media space, Kaltura, which was used to produce captions for videos. The caption generation methods taught in university Teaching Assistant trainings was generally for all subjects, but it did not redeem its full function producing dubbing videos because of the duality of subtitle language and . Alternatively, she made good use of the captioning tool that was introduced in the CTP meetings for dubbing material preparation instead. What's more, the platforms that were commonly used by the university had their specific aspects that could have been better designed to serve their purposes. For example, Y Laoshi pointed out that besides the Canvas grading tool that was mentioned by L Laoshi as not user-friendly enough for language educators, the content display under "File" column on Canvas was not organized enough for students to locate their wanted materials. This was brought up by a student of hers during one-on-one virtual talks that were required to be done with ever student, which were substitutes for compulsory office hour meetings when they had been able to meet in-person before COVID time. Upon noticing those, she brought the issue to CTP group discussion during weekly meeting. The CTP group came up with the solution of clearly tagging and linking all the files under the catalog of modules in the

homepage, plus clarifying those in the weekly summaries about what tasks were expected to be done with necessary supportive materials linked inside. Y Laoshi believed that these tips of how to efficiently guide students learning through Canvas, although not technically new for the instructors, were also important to learn, as the functions would not redeem their value until being properly used. Also developed was her knowledge about using the virtual classroom platforms, especially Zoom. The platform use demo given during CTP group discussion inspired Y Laoshi to make use of Zoom platform functions such as whiteboard for anonymous brainstorming, simple one-click emojis for comprehension check response, chatbox for real-time Q&A, etc. She found out during her teaching practice that if applied properly, these minor functions of Zoom would inject positive energy to the students since they would keep focused when trying out something new in the virtual classroom.

In terms of pedagogy-related teacher knowledge, Y Laoshi has been acknowledged that centering students' learning experience could be the key. She was made aware throughout the discussion about atmosphere and students' learning differences in different modalities and different classrooms during teacher preparation time that adjustment was a must when class shifted online, and both students and teachers were supposed to make effort on that. Students' efforts included being open to the changes and actively participate in the new form of learning activities. At the same time, teachers' mission was to motivate, and facilitate students to do so, meaning they needed to consider the everchanging situation of the specific student group they were facing, rather than having a decontextualized, pre-determined resolution. She regarded this as "way more student-oriented than just putting whatever students' need to learn in syllabus on presentation" *(Y Laoshi, Interview 4)*. Upon developing a better sense of what to expect and what to do in her classrooms, Y Laoshi started to made critical reflection about similarities and

differences of facilitating in-person and online language learning. These included classroom management, student engagement, and content knowledge demonstration, which were related to her acquiring of TPK and TPCK. Importantly, among those were the awareness of the contextual information circulating around the student community, which was the key to execute student-oriented teaching. The social reality of having to host a virtual language classroom exaggerated the gaps of in-class communication among teacher and students, which led to Y Laoshi's thinking about how to make sure students were actively engaged in the classroom interactions and willing to talk while not being overwhelmed by all the new information and requirements. This was the reason why she brought up to the CTP group discussion about giving students more "buffer time" between exercises and asking for a confirmed comprehension check, which had not been in her regular routine when teaching in-person. Technology not only served as a key element of the educational context of the school year, but also the vehicle of visualizing students' needs for teachers to learn about and react on.

> *"The burning need of making sure students are on the right track when we cannot make face-to-face interaction has been one of the most pedagogically challenging part of teaching online. Students could feel more engaged if they are provided a chance to participate and express their feelings at low risk. This can also be a strategy to boost learning outcome when we do in-person classes. " (Y Laoshi, interview 3).*

Beyond learning the professional knowledge specifically for online teaching situation, Y Laoshi developed understanding about how technology integration could facilitate language learning from its nature, and would be further implemented in future in-person language classrooms. She aligned her standing points with students' feeling, the argument being

"technology-integrated activities provide students multisensory stimulation to get input, and opportunities to make creative output" (Y Laoshi, Interview 4). Technology integration, as she imagined, would not be likely to become the primary choice of their Chinese program as they normally worked in a conservative way, not being exploratory enough to dramatically change what their original course set-up. While recognizing that this conservativeness took into consideration the consistency across grade levels and classrooms, she also believed technology-integrated activities would be still ideal to be used for pre-learning and post-learning activities, as it could be both fun and productive when multimedia materials were involved. The ways in which these technology integrated activities were incorporated should be well-planned in order to better serve the learning objects of the class, and teachers' professional knowledge of TPCK would be to key to planning the activities in accordance with the knowledge being delivered, then addressing these activities and its learning outcome during the class rather than leaving them open and unattended, or not properly addressed. To explain this, Y Laoshi sampled an activity they tried in early fall semester, when students were assigned a task about locational prepositional phrases. The two-phase activity planned by the CTP group was to let students listen to the monologue pre-prepared by the instructor, then put together the bedroom layout of a student dorm via Canva, a jigsaw software. Then they are invited to record a monologue describing their own living space. In their CTP meeting after this locational preposition week, they had a deep discussion about the effectiveness of this task series, noticing that the students were not fluent as expected using the target phrases. Although this activity series included both receptive and productive tasks with meaningful input and output, the accuracy and fluency of students using locational preparational phrases were not efficiently practiced. When doing the jigsaw, students could come to correct answer because they could get it all correct just by

focusing on these prepositional phrases, and sometimes the verb associated to those without comprehending the whole sentences/paragraphs. They could also pause or replay the monologue as they wished, which made the task easier to accomplish. When coming to the production task of explaining their bedroom, as students were expected to record, they were more likely to write down the script and read aloud instead of talking as if they were actually introducing their living space to friends. From the instructors' side, as they have no reference how each individual students' living places looked like, they could only assume students could accurately describe the layout as long as the sentences they produced was grammatically correct. Y Laoshi also brought up that the instructional team had been correcting random grammar issue when grading the recording assignments instead of focusing on the use of locational preposition phrases, which was arguably unnecessary and disturbing for students to learn the target language points. She assumed that providing fewer corrective feedbacks about the non-targeted part could be helpful to maximize the learning outcome of the targeted language points. She debated with herself about the tolerance allowed in production activities, and believed she would need further trials in actual teaching practice to learn about the appropriateness of instructor feedbacks.

After her reflection, Y Laoshi believed there was no "right or wrong" planning the task, but the learning objects of a specific module should be of priority before instructors taking care of other aspects. Technology-intensive activities and materials should be incorporated with more caution and with more instructor facilitation, especially when students were still unfamiliar with the learning materials and processes. Instructors could consider a more hands-on demonstration about how to complete the activities and explain how the materials should be used before students put their hands on them. The instructions provided should include more details, such as pauses and replays allowed for multimedia materials, tips of recording preparation for better

product quality, and step-by-step guide running through a new software/platform.

Besides all the in-class activities prepared and launched, Y Laoshi specifically spoke highly of their effort engaging Discord for learning community construction. She got in touch with, and became fluent with this tool for the first time, and became a big advocator. Making use of discord, as she considered, signaled the turning point of the interpersonal relationship among students and the instructors. Given the opportunity and the approach of communicating in the modality of individual choice (text, audio, video), students "finally did not look like they are strangers with each other and with the instructors" (*Y Laoshi, Interview 4).* Y Laoshi also argued that another fundamental contribution that discord made was the realization of self-directed group study. It was eye-opening for her to witness students' creativity doing the pre-learning activities as groups through co-editing platforms, live-streamed sections, or screen-sharing. She also claimed she became more experienced and knowledgeable about how much teacher interfere should be given if she was present in their meeting rooms, which was critical for students' independent learning and autonomy.

Throughout the investigated school year, Y Laoshi was especially dedicated to pedagogy-related topics and experience of students' knowledge acquisition. Most parts of the year have been moments of exploring how could technology-related elements help students to escape from supposed deficiency of learning Chinese through fully online course, and find breakthroughs to enhance students' learning. With the collaborative work done by the CTP group, she discovered that the learning experiences were not necessarily be sacrificed if the course design, pedagogical approaches, and ways of interpersonal communication are well planned and practiced with full consideration of the online course specialty. Y Laoshi believed that a lot of what she learnt could be transferable to future language teaching even if it would not be fully online modality, and she

would definitely revisit the new approaches the CTP group developed in the future.

7.3.2 Attitude

Being an inevitable element of the studied school year, technology integration was not a choice, but a must. This set the tone for Y Laoshi's initial indifferent attitude towards technology use in language classroom—"things have to be like this, no alternatives whatsoever" *(Y Laoshi, Interview 1)*. She understood that technology integration could cause some extra efforts in teaching preparation and teaching practice, and she was prepared for the dedication of additional time. However, she was not considering the experience of teaching online language course as forward-looking and worth further exploring at that time. Instead, she considered dealing with the issues coming with technology as "trouble-shooting", expecting her strategy as "兵来将挡, 水来土掩" *(Y Laoshi, Interview 1),* meaning "to take whatever problems that come and get it resolved". Despite she admitted that technology could be helpful to an extent for language teaching, it had yet to be the core part of how a typical course, especially a language course would be arranged. As a teacher who previously worked as an instructor of in-person language course, she already accumulated some knowledge and experience that was applicable to future teaching if everything remained similar for her. Technology integration, as the element that she and her colleagues were not familiar with, was considered as something that costs their "overwork time and extra patience" *(Y Laoshi, Interview 2)* to "resolve" *(Y Laoshi, Interview 1).* When asked about if virtual classroom would be their less preferable choice than in-person teaching, Y Laoshi agreed with no hesitation. She believed courses being shifted to online modality would definitely cause irretrievable compromise of teaching efficacy and learning outcome, and it could be more noticeable for language courses because the nature of language

learning was to learn to communicate with people while online learning essentially made students face to a screen rather than having the communicational contexts with real people to directly interact with. The potential of applying technology-integrated approach in her future language teaching was not systematically considered and carefully planned.

As time pass by, the attitude held by Y Laoshi turned less indifferent, which was firstly seen when more attention was paid on students' feedback and learning reflections. From constant teacher-student communication it was evident that the indirect form of interaction unabled in-person possibilities for students to socialize, practice and receive instant feedback from others, which could be some "disadvantages, or at least discomfort" *(Y Laoshi, Interview 3)* for both teachers and students. But she realized that on the other hand, social distancing witnessed the surge of virtual interactions, which both teachers and students were familiarized with throughout the time of COVID pandemic. Alternative competence, such as typing, as well as the cultural appropriateness revised based on the new platforms and environment, started to grab their attention, thus were collaboratively explored by teachers and students as essential knowledge and skill for members of contemporary society. What's more, Y Laoshi discovered from students' voices that a variety of technology-intensive pre-learning tasks, despite not being the CTP group's optimistic choices of learning enhancement activities, were greatly enjoy by students. These flipped Y Laoshi's attitude of technology use from questionable to helpful. She also indicated that holding the opinion that these technology-based tasks could be proactive and efficient, she would gladly extend technology use into future language teaching regardless of classroom modalities--"These technology integration did bring students a better learning experience and allowed them to have fun while accomplishing their tasks, which could potentially be generalized in our language course design, not only the one we work on, but also

the entire program" (*Y Laoshi, Interview 5*).

After the school year of online teaching went to the end, Y Laoshi no longer held a negative perception towards technology-integrated language teaching. She would like to be critically aware of the drawbacks that technology and online language course could not escape from, but also recognize the benefit and the positive aspects that technology-related activities, forms of instruction, and ways of communication would bring to this teaching and learning process. More importantly, she recognized that technology-related elements could extend the boundaries of how language education could possibility be, and those could be a beneficial add-ons for current course in the university, regardless of course modality.

7.3.3 Pains and gains

Although Y Laoshi was a returning teacher of University Chinese language course, she still considered herself as a novice teacher. As a Chinese literature student who had previous experience in language teaching, she was aware that her language knowledge is yet to be perfect for teaching, and the online school year would challenge her as a language teaching professional from all aspects. Similar as the other two CTP group members, Y Laoshi started from thinking the instructional team's work to be trying to transform the in-person course directly to online, and make the online language course as close to the previous version as possible so that students might feel minimal difference learning through the new modality. Although she was aware that the online shift could be challenging, it still surprised her how many extra attempts were needed to try out different approaches that may or may not work, and this process was by no doubts time consuming. Considering all the time and efforts that were dedicated to the course planning and lesson preparation, for the instructional team, it was not easy to lower the expectation of students

and accept the compromised learning outcome, which was another major pain point that Y Laoshi went through. Students in this different course modality appeared not reacting in the same way as she normally expected, and the learning process did not go as the same direction as she imagined. She especially mentioned it in the first two interviews that its was not encouraging that students were not likely to be practicing enough in and out of class, and the learning outcomes appeared lower than expected. All instructors in the CTP group, however, barely had additional thoughts or extra energy to make further improvement at that moment since they were also not familiar enough with how teaching online language course would work during that beginning stage. Adjustments they could possibly make were based on students' needs that they either expressed directly or performed during interacting with teachers or other students.

Through communicating with students, Y Laoshi gradually found that students had a variety of needs and expectations of the course, which was another challenge for her and the CTP team. While instructors were willing to arrange individual office hours to discuss about, then meet the need of each student both academically and personally especially during the challenging time of global pandemic, individual needs varied too much for them to track and process, and it sometimes add unnecessary burden to instructors. For instance, some of the students requested a more dedicated review sections to go through the language points they have just learnt, and asked for an overview of learning notes, which should be easily obtained by reviewing each module carefully and revisiting their class materials. Students were not responsible enough to keep themselves updated about all the course information, and attributed the misinformation to the lack of accessibility of class materials and additional information. Teachers sometimes "can't afford the time to clarify what students would need to keep themselves on track", so they just "provide the information that the students should have self-served to find out ". Y Laoshi

admitted that although she tried to keep a positive attitude towards students' requests and needs, talking and listening to individual students sometimes stressed her and her CTP team out, since what they could do to fill in the information gap was limited, especially before they established their discord server to maintain more instant communication. What's more, the struggles experienced by Y Laoshi and their CTP team reflected the inconsistency between the ideal and the reality of the institutional context, which they, the graduate assistant language instructors had little power to change. Y Laoshi, as a returning language instructor, was already familiarized with the unspoken importance of maintaining students' satisfaction rate of the course, since the department was facing the challenge of keeping up the enrollment. Sometimes she appeared to be, with the joint effort of the CTP team, "pleasing" the students instead of maintaining all her disciplines.

Admittedly, most of the pain that was mentioned by Y Laoshi was more or less related to the mismatch of prediction and reality when the course was shifted online, which left her a negative first impression about technology being the main vehicle of teaching. With time pass by, however, she developed a critical view about how technology-based teaching, due to the on-going situation of online-only mode of instruction, could function well enough, or in some respects even better than face-to-face teaching. Y Laoshi expressed her appreciation towards this time of change as it expanded her insight about how language teaching could be, both technically and ideologically. Speaking of the technical aspects, she and her colleagues were able to confidently produce more varieties of activities, materials, and ways of communication, all of which mirrored a more authentic mode of social interaction. She believed that she was equipped with better creative thoughts and skills to integrate technology elements into future language teaching, let it be either online or in-person. At the same time, with the challenge of adapting to a

new mode of teaching and all the creativity, she was more sensitive about the dynamic in the classroom interaction, students' reaction of their learning experiences, and their thoughts reflected in their feedbacks. It was the sense of lacking personal connections that reminded Y Laoshi to be more aware of those, but building such connection virtually during the online school year was considered harder than having the face-to-face opportunities. Y Laoshi developed her strategies of understanding the climate in which she host her class, both institutionally and socially, then "more actively seek for hints about how her teaching could better serve the needs of learners in order to conduct efficient teaching" (*Y Laoshi, Interview 5*).

Speaking of the ideological aspects, Y Laoshi noticed that she developed a more open-minded perspective of change and challenges as a language educator. The encounter of having to teach language course online had its sociohistorical background of that specific time period, but what she as an educational practitioner gained was the self-confidence of being able to respond to the everchanging situation and overcome the difficulties that could possibly confront her. She was also aware that elements of technology, even if not being as fundamental as in fully online course, would be an inescapable norm for future language education. The experience of getting intensive experience of technology would be meaningful for her future profession as a digitally competent language educator.

More practically, Y Laoshi became more familiar with the Chinese language program in their department, students who are enrolled, and how Chinese learning could be shaped in order to meet the requirement of their specific curriculum under the circumstance of online-only course set-up with this student group. She became more experienced about communicating the requirements and target knowledge of the course to students through virtual platforms, monitoring the information delivery, and if necessary reaching out further for students' individual

needs:

> *"I have been more realistic about what I can do and what I should do to ensure the students get the most out of Chinese classroom. If students and I have disagreements, I can point it out and get it solved. If not, I can make use of the knowledge and resource I have accumulated to let it happen, with the support of my team." (Y Laoshi, Interview 5).*

Y Laoshi was also aware that this would not happen without the knowledge bank that was gradually expanded throughout the year. Although the content knowledge itself could be course-specific, Y Laoshi believed that technology-related pedagogy, and the ability to keep responsive towards the contextual factors would profoundly benefit her throughout her career.

8 Findings

Descriptive data collected during CTP group meetings and individual interviews indicates that studied Chinese language instructors were able to work collaboratively to establish their updated mode of teaching due to the inevitable modality shift from in-person to fully online during COVID-19 pandemic. Their CTP attempts served as a learning activity for the participating CTP group members, not only facilitating course adjustments that suited the ongoing situation of emergency remote teaching, but also grounding teachers' individual development as competent educators of technology use.

8.1 "What did we find"

Data shows that the all the three teachers in the language course CTP group went through their online school year teaching with mutual support and profound professional development.

The community dynamic of the teacher team was active and supportive.

Based on the horizontal axis of the development coordinate system, it indicates the exploratory attempts to innovatively design the course and prepare for technology integrated teaching are made as a CTP group to modify the traditional language program into what was needed for this school year. Successfully teaching an online Chinese language course being the goal, this CTP group managed to build their new mode of instruction based on the curriculum traditionally used in their program. Technology being the precondition, challenge, and solution at the same time, teachers' collaborative effort was to meaningfully incorporate technology in their renovated language course rather than to portray it as unwanted adjustments the class needed to suffer from because of the COVID situation.

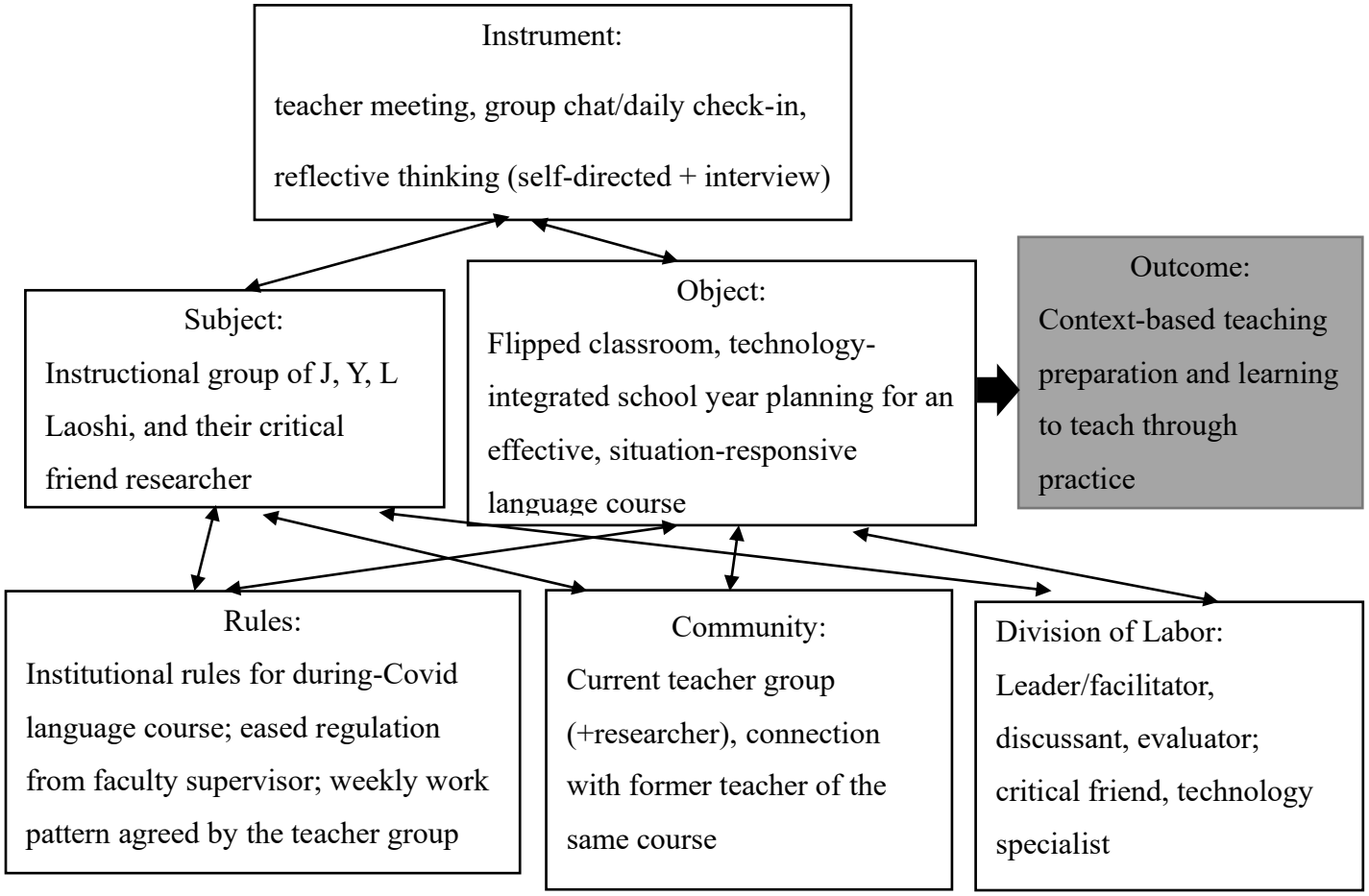

Figure 21 Activity system of the collaborative teaching preparation

The activity system (see Figure 21) concludes the structure of teachers' CTP as a year-long activity. CTP as an activity held a school-year specific object (achieving effective technology-integrated school year through flipped classroom approach, preparing and teaching online language course and learning to teach through practicing) and led to a broad outcome (making successful context-based teaching preparation and learning through teaching practice). As the approach that the program had not find a chance to be incorporated in pre-covid time, "flipped classroom" seized the chance of big scale course renovation, and became the leading idea of their adapted teaching plan. It was believed to be time-efficient to make use of their off-class learning as chances for knowledge input, and in-class time as opportunities to put learnt language into practice, especially when very limited in-person interaction using Chinese language could be guaranteed. Through the discussion based on their knowledge from previous individual learning, all teachers reached agreement on shifting their discussion sections into more interactive practice space for comprehension check, context-related practice, and purposeful interpersonal connections—on the condition that students' pre-learning was properly done. Guided by this leading idea, the CTP group explored their own way of technology-integrated teaching from seven aspects: general course set-up, digital platform use, off-class activity design, in-class pedagogical practice, digital course material preparation, assessment and evaluation, and workload management and self-care. Each of the aspects formed an object of their CTP activities during the school year, and they made progress in every of these aspects. They gradually found the "sweet spot" of how technology elements could serve their goals of Chinese language teaching effectively under the context of their specific program. Also constructed was their solid mode of teamwork and the friendship among the community members. They established their accustomed mode of collaboration, agreed on the division of labors based on

their goals, and felt the sense of belonging and certainty of mutual support while working together.

Expansive learning cycle to some extends explains the process how each sub-object was being explored. Instead of aligning with the cycle of expansive learning step by step, the CTP group's exploration of each technology integration aspects went back and forth along the expansive learning cycle, negotiating with the students' learning condition as well as the contextual elements of their course and program. By doing so, the CTP group developed technology-related awareness and strategies to conduct language teaching in virtual environments. The design of an online language course was no longer a proposal, but empirical throughout their trials and negotiable among all classroom practitioners, which could indicate profound potentials for future curriculum developments.

Rooted in such collective efforts of exploring technology-integration teaching in this Chinese language program, professional growth of in-service teachers was witnessed throughout the year, CTP meetings being the epic center that concentrated their mutual learning essence. In the teacher meetings, teachers reflected on their weekly progress of learning and practicing effective language teaching, technology integration being an important component. They collectively identify types of appropriate technology use and share their existing knowledge among group members so that the knowledge of one person became knowledge for all. Beyond sharing general knowledge, they also contextualize technology use in their own teaching environment and do trouble shooting so that all teachers could gain practical knowledge how to teach with technology in realistic situations. Also critically important was their reflective learning from observing each other's teaching practice and sharing thoughts within the group. Through a third person perspective, teachers were able to better understand about and evaluate

each other on how successfully technology integration incorporated with the current course design. Learnings taking place in CTP groups ranged from the macro to micro stance of technology integration, regarding the CTP meeting as the major presentation vehicle about what have been discussed and how their decisions could be translated for different Chinese language course scenarios.

All teachers in the CTP group have also experienced their professional growth individually as technologically competent language educators. Developed teacher cognition on technology integration was evident across all CTP group members along the studied school year. These three teachers in varies stages in their language teaching profession implied that thanks to the collaborative working experience as a CTP group member, outcomes of their workplace learning was fruitful. Their knowledge of technology-integrated teaching has been largely improved in both dimensions of variety and fluency:

In terms of variety, all teachers enriched their collection of technology used for class outside their comfort zone of canvas-embedded softwares and explored further. It was an eye-opening experience to explore more possibilities of innovative teaching that had been brought to their attention. Some main tools/online platforms mastered by the group included but not limited to Zoom, iMovie, Arctime, Discord, Wordcloud, Quizlet, Canva, Chrome video browsing and downloading plug-ins, in addition to Canvas and Canvas-embeddable tools including Kaltura mediaspace and Google series. During the expanding of their technology use collection, teachers also extended their understanding of technology-based literacy and technology-integrated pedagogy. Being able to incorporate a variety of technology elements into language teaching practice indicated that the instructors had grown wisdom of choosing and applying appropriate technology for their specific course design with a specific goal of teaching towards a specific

student group. The traditions and essence of Chinese language teaching in their specific program, such as balanced focus on listening reading speaking and writing, non-compromised character handwriting, grammar-oriented content knowledge delivery with abundant practice in context, were able to be carried on by each instructor with the help of technology integration. These would be helpful not only for online course, but also for potential technology use in hybrid or in-person courses.

In terms of fluency, all the instructors in the CTP group developed not only on how to operate the softwares, but also how to make the most use of the technology to assist their tentative teaching plans. Upon proposing what types of technology would be applied in their teaching, individual instructors consult to collaborative efforts to develop proficiency using those in general in advance so that they could comprehensively predict the mechanism of how technology would function in their teaching practice, then contextualize the use for their specific needs. As learning took place hand-in-hand with teaching practices, instructors developed their teacher knowledge using technology with slight individual differences working on different sets of teaching preparation tasks throughout the school year. One teacher could become more fluent on the type(s) of technology that he/she frequently work with when accomplishing their own teaching and teaching preparation work, while less fluent on the ones not included in his/her everyday tasks. The CTP group collectively made sure that there was at least one teacher specializing in each type of technology in the team, and negotiate about how it could better serve their goals reflectively after teaching practice started. This made sure the CTP group improved their joint strength with all teachers learning the knowledge by practicing, sharing, and reflecting, while still allowing individual differences of strengths and weaknesses. Critical issues of those technology integration attempts were also identified and discusses to expand the

potential of more successful technology integration and teachers' capability of technology use.

Also evolving were teachers' beliefs about technology use in language teaching. They started the practice of technology integration committing minimal fulfilling obligation of running full online course at the beginning of the school year. Through their discovery of students' high engagement in technology-enhanced activities and their own tryouts of multiple technological tools, they were more willing to, and actually practiced incorporating a wider variety of technology to support student learning both effectively and efficiently. All teachers in the CTP group developed a more positive attitude and faithful belief towards technology as a form of instruction, as an instrument to deliver content knowledge in language teaching, as a vehicle of interpersonal communication. Although they still did not consider themselves as a pro-technology language instructor, they all extended a more friendly gesture towards technology elements throughout their teaching, and believed that technology could do good to language teaching in general. This was reflected in their acceptance of a bigger variety of technology tools in their daily teaching practice, and a more active thinking about how virtually conducted language teaching could inspire future language classrooms regardless of modality. Their attitudes towards technology integration have been shifting from being skeptical to being faithful by foreseeing the potential of applying what they experimented in virtual environment to future in-person or hybrid classrooms.

Very importantly, all the instructor developed their sense of social awareness of their classrooms. This includes the flow of instructor-student interaction, institutional requirement and regulations applying in course planning and teaching practice, as well as sociocultural realities that may critically shape their classrooms, their course design, and even their Chinese language program. They believed that reading all these social conditions gave them more guidance how to

strategically plan and practice their teaching. Specifically crucial was that they as a team agreed and assured that the particularity of the student group they were teaching conveyed to their pedagogical plan, including creating sense of togetherness and building learning community as connected as they could achieve. In their individual reflective thinking of their technology integrated teaching practice, teachers' bringing up of actively considering the students' situation and make responsive adjustments indicate that they just developed their beliefs of fitting students' learning experiences with what their willingness and need would lead them towards. This was considered challenging especially with the fixed curriculum and the strict grade level system[10].

What was surprising for the researcher as a critical friend was the fact that although COVID-19 has brought Asian hate, specifically towards China where this disease that was firstly discovered in, as well as relevant general racial issues to public attention, the discussion of global and local issues in this aspect merely appeared when they did small talk before touching the teaching preparation during teacher meetings. Instructors avoided discussing it as a political and social issue about China even though they were teaching the language of Chinese, and were supposed to thoroughly discuss the cultural topic around the language and the relevant nations. Instructors' rationale about this indicated that as a teaching professional of Chinese language especially working in Western countries, they were told to avoid, or at least very carefully discuss topics that were politically and cultural controversial so that they would not get stuck by issues caused by sensitive topics.

During the journey of learning and practicing technology-integrated language education,

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[10] The Chinese language program in this university follows strict grade level, making the lower grade course a pre-requisite of an upper grade. For example, to take Second semester Chinese you need to either accomplish First semester Chinese, or prove to the department you did a similar enough class to fulfill the requirement.

teachers worked in CTP group when confronting with both pains and gains. Challenges they faced were about reading, understanding and adapting to the new norms of the non-traditional modality of language teaching—facing potential work overload of taking extra time and efforts to get along with the technological tools they newly familiarized themselves with; overcoming constraints from the social and institutional contexts adapting the course design and material into a technology-friendly version, react and respond to the mental gaps developed during the shift from in-person to online language teaching and learning for themselves and students.

At the same time, they were grateful for the experience because of all the gains they got, including: developing advanced digital literacy skills in teaching as well as in general as a human, fostering critical understanding about traditional language curriculum and language programs, developing sensitivity and responsiveness towards the context and their students in evolving situations, self-evaluation and gaining confident facing changes and challenges as a language educator, teamworking and networking with peers who would potentially support each other in their professional field.

Teachers varies among each other about what they believed was the most important gaining. The most experienced teacher treasures the online teaching experience as an opportunity to update the already established assumptions and habits teaching in this specific program, getting injected with new knowledges and innovative ideas about how to think out of the box and provide students a more relevant and efficient learning experiences. Being “obliged” to teach in an unfamiliar environment has successfully forced her to get exposed to technology skills that they used to avoid and recognize their importance as part of digital literacy, thus reached an extended the spectrum of applicable pedagogical choices as a more technologically competent language educator. Also gained was her holistic vision of how their Chinese language program

and language education in college could evolve with all technology possibilities acquired, both by putting previously theoretical implications into practice and by renovate the course and the curriculum with critical thoughts and practices.

Instructor who was on the less-experienced side had fewer pre-set perspectives about how technology should or should not be engaged in their teaching. Instead, technology has been the spark to understand how to conduct effective language teaching, especially in terms of student responsiveness and critical communicativeness in their teaching practice. Besides getting familiar with multiple software and platforms of technology integrated teaching, they also got exposed to the most up to date language and literacy skills that language education should take into consideration in the digital era, established their cutting-edge understandings how language teaching could be with technology being an underlined condition.

8.2 "What does this mean"

Findings of this research indicates that challenges are essentially signs of chances and improvements. Confronted with the challenge of make covid-related adjustments, the Chinese language course instructors reacted actively towards the necessity of technology integration. Technology being the core studied challenge of language education, it has been way more influential than being a changed form of instruction. Chinese language educators in the CTP group dealt it with care and patience by not only carefully planning for inevitable shifts including using zoom platform and preparing digital materials, but also critically predicting how could Chinese language teaching benefit from features of the new modality and elaborate on the specialty of online learning. These instructors critically altered the encountered challenges into chances for curriculum and pedagogy developments, thus focused on making the most out of

those with the support of the researcher. They developed their interpretation about what in their course had been modified by technology, and what could they do responsively to keep up with their expectation how teaching could be done under this evolving circumstance. Flipped classroom approach and intensive pre-learning activities were no longer unrealistic implications of better language teaching existing in their pedagogy course reading lists. Being able to put those into practice was a milestone for the instructional team to progress instead of compromise considering the sociocultural context they were located in. Instructors was introduced to, and with time passing by, developed agencies of the multiplication of learning facilitation methods. They landed themselves in a favorable position where student learning was distantly traceable and evaluable, which pushed forward the communicative approach of language teaching and learning in their program. They were also gradually equipped with competence that empowers them to act accordingly to the technology integration necessities and possibilities in order to optimizing students' learning experiences.

More meaningful is the mode of collaboration that they developed, the CTP group, in which all these progresses were based in and benefit from. The configuration of three instructional team members and one researcher/technology specialist have been extensively made good use of, and redeemed its value while witnessing both the evolving course design and teaching plans. Instructors can come together to not only plan for their daily classes but also get each other ready as competent language instructors. This teamwork model provided the soil of profound opportunities for individual professional growth. It has been proved meaningful especially for instructors to learn practical knowledge and reflectively expand their profession being technology-friendly educators who were skillful and strategic about when and how appropriate technology elements should be incorporated to maximize the benefit in the specific contexts of

teaching. Considering the future possibilities of resuming face-to-face teaching and working modality, this form of collaboration could be recaptured in their forms of teacher community to facilitate efficient teaching preparation.

Challenges these language educators came across during the global pandemic were more than short-term covid responses. Instead, they served as a reminder that the language education profession should be renewed to accommodate the ever-changing reality in the digital era. Aspects of changes included curriculum, pedagogy, and organization of education, which respectively lead our critical thinking of what to teach, how to teach, and in what context would teaching happen (Zhao & Watterston, 2021). Responsive online shift of the course during COVID-19 pandemic has been the catalyzer of the teachers' reflective thinking of their previous teaching mode and ongoing exploration about how to perfect that. Pros and cons of online language learning being frequently discussed, it could be meaningful for language instructors to make good use of their strength to embrace the technology-integrated elements in their teaching practice and further develop their profession.

8.3 Implication

Findings of the current study have their implications towards the field of language education, not specifically targeting at college/university language instructors of Chinese. These implication extends from this specific college-level Chinese language instructor group towards instructors of different languages and different contexts of teaching.

For instructors of different languages, it is important to note that technology has the potential of being meaningfully adapted according to the need of language and literacy education in specific classrooms, let it be different digital literacy characteristics, different culture embodied

in languages, or classroom interaction patterns in different institutions and program features. The information disseminated from the current research indicates that instructors when forming a collaborative group should be able to collectively acknowledge the changing body of language knowledge and pedagogical language, as well as reflect on and refresh their pedagogical reasoning and decision according to the contexts. Also thought-provoking is the implementation of flipped classroom approach along with technology integration, which used to be challenging to put into practice in the traditional modality of language teaching. It is noteworthy that the mode of teacher collaboration in this research was the agreement made by this specific instructional team with a background culture of Chinese. Instructors of other languages could develop interests, and eventually decide on alternative modes of CTP groups, then reflect on the contextual information that appear important for them.

For language instructors working for different school contexts such as language institutions and K-12 schools, although fundamental differences are present compared with the current search in terms of curriculum plan, objects of teaching, context of teaching and more, it is still meaningful to absorb the mindset of regarding CTP as a teacher learning process. Each school context brings in its own feature of classrooms and challenges for instructors, which is hard to list until saturation. Instead of making CTP a trouble-shooting mechanism, this study invites language instructors in various schools and programs to develop sensitivity towards their context and capability to make active responses. Teachers who share similar teaching object would benefit from each other sharing experiences and thoughts to effectively and meaningfully engage multilingualism and multiculturalism into their profession, thus practice language teaching accordingly. It is critically important for the educators to bring social reality and cultural issues into everyday discussion for language classrooms with the purpose of teaching language as a

vehicle of culture. During this process, educators of various context are also expected to develop on their own, keeping pace with the time to be able to facilitate the tide-seizing growth of their students.

9 Conclusion

In the heated discussion recently, educators in multiples fields have regarded technology as double-edged sword, which indicates that while being accepted and incorporated in teaching, it does not always yield a fully optimistic result for student learning (Carroll & Eifler, 2002; Haque, 2011; Khechine & Lakhal, 2018). Nevertheless, technology brought critical changes that are profound and thought-provoking to education. Despite of the limitations mentioned above, this research has portraited the process how language instructors of university level Chinese language course prepare for their teaching during COVID-19 pandemic with the influence of technology integration.

In this current research, ethnomethodological observation of a group of Chinese language educators' situated practice of collaborative teaching preparation as well as individual narratives about their professional learning experience to be technologically competent are documented. It is evident that Chinese language teaching being successfully shifted online has been an opportunity for both course revolution to become technology-friendly and educators' workplace learning to become technologically competent. During the studied online school year, careful course redesign, mindful lesson planning, and strategic pedagogical practice have constructed a course that was responsive to the pandemic reality that was in tandem with sociohistorical background, institutional climate, and individual students' needs. For these instructors of university Chinese language courses, the online school year has been one of the situations where

they, while attempted to adjust the course to be technology-friendly, come across challenges and experience professional development out of it. The experience of the specific teacher group indicates that collaborative teaching preparation has been one of the major approaches where teachers bond to overcome challenges and seek for proper solutions. Working collectively as a team has been implicational to future teaching that forming collaborative teaching preparation groups could be a crucial resolution for any challenges they might face to. Such collaboration includes but not limited to identifying and making good use of individual teachers' strength, distributing workload of teaching preparation, as well as observing and offering suggestions for each other's work. Activities in the CTP groups focus on the practical aspects of perfecting teaching to serve specific student group under specific context, which indicates educators may count on group efforts to co-construct the educational environment, learn from their practice, overcome the challenges, and celebrate the achievements.

Also discovered in this research is that technology integration, being the main theme of challenge faced in the studied school year, has transcended it's doubtful impression held by Chinese language educators. These classroom practitioners have combatted with the perception of technology integration as a compromise that language education had to endure, and have attempted to gain credential for technology use in forms of language teaching—not limited to online courses but also future mode of in-person or hybrid courses. No doubt that different courses in different social and institutional environment should be planned and executed differently, but technology incorporation has offered a whole series of possible enrichment. It would increase the diversity of course materials, activities in and out of classes, and ways of building the learning community.

Professional growth of individual Chinese language educators during the collaborative

working atmosphere was also present in all studied instructors' narratives. What could be learnt when reflecting on the trajectories of those three is that general training for educator could be helpful but not necessarily targeting at the needs of the specific course and targeted student group. Having the mindset of regarding teacher collaboration as an opportunity to conduct professional learning encouraged instructors to be more open sharing their questions and concerns instead of merely to try to get teaching job done. Discussions made in CTP group meetings, although still aimed at getting ready for the following week's class, shed more light on what knowledge and skills Chinese language instructors need to guarantee a good quality teaching and how to achieve that. Their model of collaboration in CTP group set an example for future teacher groups to maintain a more community-like relationship among group members and work together beyond trying to get the teaching job done but also as peers discovering new territories of teaching and helping each other through hardships. Learning from the problems in teaching and learning from each other's experiences have been proved to be effective, and should be carried on as group workplace learning effort.

Beyond indicating suggestions for future course co-instructors and in general Chinese language educators, findings of this research also point out some potentials for future research. Firstly, technology integration as the workplace learning outcome of the CTP group would only be validated through utilization in future teaching practice. Until the end of the studied school year, language instructors' technology integration as enrichment for traditional classroom practice still stays hypothetical. Follow-up investigations are needed about how explorations of technology use during the fully online course modality could be transferred and made effective in post-COVID time when language courses return to face-to-face or hybrid modality. Secondly, teachers' belief about technology engagement in their routine teaching, as an everchanging

entity, should draw constant attention from researchers. Instructors tend to hold a doubtful perspective towards technology, which led to the idea of using technology as the major form of instruction during the era of global pandemic was a compromise that had to be made. After experiencing the inescapably technology-intensive teaching, language instructors have developed their critical understanding about it, including its benefits of knowledge and information diversity, connectivity to modern society, and innovation in teaching, as well as its challenges of ethics issue and potentially unequal accessibility of educational resources for different social groups. Instructors' willingness and perceived effectiveness of applying technology integration when technology is an option instead of a must still need to be empirically approved in their future planning and teaching. Thirdly, the constructed teaching community of the studied CTP group may shift when their co-teaching relationship terminates, thus it could be meaningful to further track how the professional relationship built during the studied school year would develop in the upcoming school years when these instructors may or may not teach a same course as a group. Also possible would be a size change of their community—either remain connected with a part of their previous CTP group, or manage to expand it to a larger group with members who share similar interests and teaching goals. It would be interesting to keep tracking of the studied instructors about the maintenance of their current group relationship as well as their further development of other CTP groups, or if they would develop professional relationships of other kinds to help them grow as language teaching professionals.

Appendix A IRB approval letter

Education and Social/Behavioral Science IRB
10/2/2020

Submission ID number:	2020-1261
Title:	At the crossroad of technology integration: How collaborative teaching preparation facilitate language educators to develop
Principal Investigator:	Peter S Wardrip
Point-of-contact:	Jingyi Zhou
IRB Staff Reviewer:	Stephanie Wilson

A designated ED/SBS IRB member conducted an expedited review of the above-referenced initial application. The study was approved by the IRB member. The study qualified for expedited review pursuant to 45 CFR 46.110 and, if applicable, 21 CFR 56.110 and 38 CFR 16.110 in that the study presents no more than minimal risk involves:

Category 6: Collection of data from voice, video, digital, or image recordings made for research purposes
Category 7: Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, or quality assurance methodologies

As part of its review, the IRB determined this study does not require continuing review either under federal regulations or institutional policy, or both. Please note, however, that although this study is not required to undergo continuing review, you must still submit the following to the IRB:

1. Changes of protocol prior to their implementation (unless the change is necessary to eliminate an apparent immediate hazard to subjects)
2. Addition of new study personnel
3. Funding updates
4. Reportable events (unanticipated problems, noncompliance, new information) in accordance with institutional policy
5. Closure report

In addition, please be aware that the type of funding that supports a study or whether the study falls under FDA regulations can affect whether continuing review may be required in future.

To access the materials approved by the IRB, including any stamped consent forms, recruitment materials and the approved protocol, if applicable, please log in to your ARROW account and

view the documents tab in the submission's workspace.

If the IRB required informed consent, please use only copies of the approved consent forms or information sheets to obtain informed consent; give all participants a copy of the consent document.

If you requested a HIPAA waiver of authorization, altered authorization and/or partial authorization, please log in to your ARROW account and view the history tab in the submission's workspace for approval details.

You have identified the following financial sources to support the research activities in this IRB application:

None.

If this information is incorrect, please submit a change to modify your application as appropriate.

Prior to starting research activities, please review the Investigator Responsibilities guidance (https://kb.wisc.edu/images/group99/shared/BSIR) which includes a description of IRB requirements for submitting personnel changes, changes of protocol and reportable events.

If you have general questions, please contact the Education and Social/Behavioral Science IRB at 608-263-2320. For questions related to this submission, contact the assigned staff reviewer.

Appendix B Participants recruiting email

Dear XXX,

Hello. You are receiving this email because you are a member of professional community that collaborative work on Chinese language teaching, and you are experiencing a transition from in-person to technology-intensive online teaching.

The purpose of the research is to understand how teachers work together to adapt to the technology-intensive form of language teaching, how teachers reflect on their collaborative acquisition of technology-related teacher knowledge, and how such collaborative teacher learning experiences inform their future practices as language educators.

We are seeking a group of teachers who currently teach a Chinese language course and are engaging in collaborative teaching preparation. You may qualify for this research because

- You are above the age of 18

- You are currently teaching a University-level Chinese language course which transitioned from in-person instruction to online teaching

- You are in a collaborative teaching preparation group to improve your teaching

If you have questions about the study, please contact the researcher Jingyi ZHOU via jzhou359@wisc.edu. If you are interested in participating, please sign the consent form attached above, and send it back as a reply to this email. Thank you for your interest in this important research.

Sincerely,

XXX

Appendix C Participant Information and Consent Form

UNIVERSITY OF WISCONSIN-MADISON

Research Participant Information and Consent Form

Researcher: Jingyi Zhou (email: jzhou359@wisc.edu tel: +1(608)-622-0620

Principal Investigator: Professor Peter Wardrip (email:wardrip@wisc.edu)

DESCRIPTION OF THE RESEARCH

You are invited to participate in a research study about teacher development regarding technology integration in language education. You have been invited to participate because

1) You are a Chinese language educator who are experiencing a transition from in-person form of teaching to an online, technology-intensive one.
2) You have been participating in the voluntary collaborative teaching preparation group of investigating how to better practice language teaching when transitioning online.

The purpose of the research is to understand how teachers work together to adapt to the technology-intensive form of language teaching, how teachers reflect on their collaborative acquisition of technology-related teacher knowledge, and how such collaborative teacher learning experiences inform their future practices as language educators. As a process of informed consent, you are welcomed to ask any question about the form and the research before completing it. You can decide if you want to be in this study after your questions are answered.

WHAT WILL MY PARTICIPATION INVOLVE?

This is a study of approximately one academic year.Your participation will consist two parts: Teacher group meetings and interviews. For the teacher group meeting part, your teacher group arranges the meeting throughout the studied period. Researcher observe all your group meeting upon your permission. For the interview part, you may be invited into 6 interviews in total, approximately 40-60mins each.

The chart below gives you some information about the interviews will be conducted:

	Time	Form
Initial interview	Beginning of the research	Individual
Semester 1 mid-term	Within two weeks after Mid-term	Individual/group

interview		
Half-way interview	First week of Semester 2	Individual/group
Semester 2 mid-term interview	Within two weeks after Mid-term	Individual/group
Wrap-up Interview	Within two weeks after final.	Individual/group
Follow-up interview	Two months after Semester 2	Individual

All forms of meetings and/or interviews will be conducted in the form and location of your choice (individual or group meeting, virtual or in-person, place to meet, etc.). These interviews are mainly about your experiences and thoughts about technology integrated education and collaborative teaching preparation.

As part of the study we may take notes and collect the video recordings of your meetings and the interviews. Recordings will be kept for three months and destroyed following completion of the study. Recordings will not be used for purposes outside of the study. You may choose not to be in video recordings. If you do not agree to video-record, researchers will not keep you recorded and use field notes to complete that part of the study. We may also ask for some teaching materials that you use in class (PowerPoints, videos, etc), and other teacher collaboration artifacts that you've created during the studied collaborative teacher preparation. This is optional, which means you have full right to agree or refuse to present these to the researcher. We are aware that some artifacts are related to more than one person in your group. In this case if anyone of you choose to opt out, these group artifacts will not be collected.

A written copy of the recordings (transcription) may be made for use in the research. The transcription may be used for future research or publications. The transcription will be kept indefinitely, meaning we have no plan to destroy the transcription. The transcription will be edited to remove all of your identifying information before they are banked.

You may skip any question in the interview that you do not feel comfortable to answer. You can also choose the form of interview (individual or group conference) as your mid-way and wrap-up interview. Your participation is completely voluntary. If you decide not to participate or to withdraw from the study, it will have no effect on any of your courses or your degree at UW-Madison.

WILL I BENEFIT FROM THIS STUDY?

Although you will not be directly benefit from the study, being in this study may help you learn more about technology use in language teaching, critically reflect on the effort of

acquisition of technology-related competence as a teacher group, and facilitate further development opportunities as a technology-competent language teacher.

ARE THERE ANY RISKS TO ME?

There is a risk that your information could become known to someone outside this study.

There is a risk that you are frustrated by the form or length of meetings

To minimalize the risk, you can assess the risk and opt-out at any time. We also will work on protecting your confidentiality (see below).

HOW WILL MY CONFIDENTIALITY BE PROTECTED?

We have strict rules to protect your personal information. Only the research team has access to your name, address, phone number, and other information that can identify you. All your information will be stored securely. We may publish and present what we learn from this study, but none of this information will identify you directly without your permission. Your name will not be used. You will be able to choose the pseudonym used for you in publication

We would like to be able to quote you directly without using your name. The transcription and field notes may be retained for future research. Retained data will be de-identified. With appropriate institutional permissions and confidentiality protections, we might use information that we collect during this study for other research or share with other researchers without additional consent from you or your legally authorized representative. If you agree to allow us to do so, please initial in the box in front of the statements at the bottom of this form.

However, please be informed that we cannot guarantee complete confidentiality of your information. Confidentiality cannot be guaranteed in a group setting, however, participants will be asked not to discuss the conversation outside of the group. If abuse or neglect is witnessed or suspected confidentiality will be broken.Your information may need to be presented to the university or government officials responsible for monitoring the safety of the study upon request according to Federal or state laws. We may also have to tell appropriate authorities, if we learn during the study that you or others are at risk of harm (for example, due to child or elder abuse, or suicidal thoughts).

WHOM SHOULD I CONTACT IF I HAVE QUESTIONS?

You may ask any questions about the research at any time. If you have questions about the research after you leave today you should contact the researcher Jingyi Zhou through jzhou359@wisc.edu or at +1(608)-622-0620. The Principal Investigator for this research is Professor Perter Wardrip.

If you are not satisfied with response of research team, have more questions, or want to talk with someone about your rights as a research participant, you should contact the Education and Social/Behavioral Science IRB Office at 608-263-2320.

AGREEMENT TO PARTICIPATE IN THE RESEARCH STUDY

By initialing in the box and inserting my signature below, I am electronically signing this consent form:

☐ I agree to be video recorded upon request by the research team, and I understand I have the right to pause the recording of mine at any time.

☐ I give my permission to be quoted directly in publications without using my name.

☐ I have read this consent form, had an opportunity to ask any questions about the participation in this research and voluntarily consent to participate.

Signature: _____

Date(mm/dd/yyyy) _____

****You can print or save a copy of the consent for your record ****

Appendix D Observation sheet

Date		Time	
Participants		Topic	
Types of technology used for the meeting			
Types of technology discussed			
OBSERVATION NOTES			

Appendix E Interview schedule and protocol

	Time	Format
Initial interview	Beginning of the research	Individual
Semester 1 mid-term interview	Within two weeks after Mid-term	Individual/group
Half-way interview	First week of Semester 2	Individual/group
Semester 2 mid-term interview	Within two weeks after Mid-term	Individual/group
Wrap-up Interview	Within two weeks after final.	Individual/group
Follow-up interview	Two months after Semester 2	Individual

Initial interview:

- Language teaching/learning with technology integration
  - Your previous experiences teaching and learning (in general) online
  - Your previous experiences and reflection about teaching language classes using technological tools
  - Your attitudes and expectation about teaching online language classes, both in general and in specific course you are teaching.
- Collaborative teaching preparation
  -Your previous experiences of teacher collaborative learning/collaborative teaching preparation experiences.
  - Your current relationship with the teacher you do collaborative teaching preparation with.
  - Your collaborative teaching preparation plan for teaching
  - Your expectations about the collaborative teaching preparation.
- Technology fluency as language educator
  - Your previous professional development experiences about technology-related topics and your reflection about this.
  - Your current preparedness as perceived by yourself regarding technology intensive, virtual language classroom.

Semester 1 Mid-term Interview Protocol

- Language teaching/learning with technology integration
  - Enjoyment (both anticipated and unexpected ones) you met during the transitioning to online teaching.
  - Challenges (both anticipated and unexpected ones) you met during the transitioning to online teaching. If this is solved, how? If it is still unsolved, what is your next step about it?
  - Your perceptions about using technology in language teaching, if there is any change since the last interview, explain more.
- Collaborative teaching preparation
  - Your experiences in collaborative teaching preparation sections
  - Moments of teacher collaboration outside of the things and topics outside of weekly meetings
  - Your reflection about the effectiveness of collaborative teaching preparation.
  - Ways in which you would like to change in our teaching preparation meetings.
- Technology fluency as language educator
  - Technology-related knowledge/skills/tools/methods that you newly acquired, and the ways in which you incorporate those as a language educator (May require artifacts to be presented).
  - Questions and directions regarding technology use that you expect to explore in the second half of the semester.

Half-way interview:

- Language teaching/learning with technology integration
  - Your experiences in the past semester about using technology in language teaching.
  - Your reflections about technology integration in language classrooms.

- Changing and unchanging perceptions about technology integrated teaching in general compared with the initial interview. Explain how it happened.

- Collaborative teaching preparation
  - Your experiences and reflection about collaborative teaching preparation for online teaching.
  - Your relationship with the teacher you do collaborative teacher preparation with.
  - Your collaborative teaching preparation plan in the upcoming semester, and your expectations about it.

- Technology fluency as language educator
  - Highlights of these newly acquired knowledge/skills/tools/methods that you expect to continue to use in future teaching (both virtual and in-person), and possible ways to adapt.
  - Your current preparedness as perceived by yourself regarding technology intensive, online language classroom.
  - Questions and directions regarding technology use that you expect to explore in the second half of teaching and collaborative teaching preparation.

Semester 2 Mid-term interview

Same as Semester 1 Mid-term interview

Wrap-up interview protocol

- Language teaching/learning with technology integration
  - Your overall experiences and reflections about technology integration in your language classroom.

- Collaborative teaching preparation
  - Your overall experiences and reflection about collaborative teaching preparation sections

- Your relationship with the teacher you do collaborative teacher preparation with.

- Technology fluency as language educator
  - Knowledge/skills/tools/methods that you developed through collaborative teaching preparation for online teaching.

  - Possible ways in which you incorporate newly developed knowledge (during the collaborative teaching preparation of online teaching) into your profession as a language educator.

  - Your current preparedness as perceived by yourself regarding technology intensive, virtual language classroom.- Questions and directions regarding technology use that you expect to explore more in the future

Follow-up interview protocol

- Language teaching/learning with technology integration
  - Current situation of the language classes you teach, and your thoughts about it (if any)

  - Your attitudes and perception about the future of technology-integrated teaching and learning

- Collaborative teaching preparation
  - Current situation of your collaborative teaching preparation sections (if any)

  - Current relationship among the teacher participants of our studied period of collaborative teaching preparation group

  - Your reflection about collaborative teaching preparation in relation to general experience of technological-related development as a language educator

  - Your advices for future collaborative teaching preparation sections

- Technology competence as language educator
  - Technology-related knowledge/skills/tools/methods that you have learnt and adapted that

you consider as helpful, why, and how you continue to incorporate into your teaching.

- New achievements and/or issue that you have come across after the studied period of collaborative teaching preparation section

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