Teacher and Student Perceptions of Educational Technology Integration: A Study of Four Chinese Language Classes at a Japanese University

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June 24, 2022

A doctoral dissertation submitted to the Graduate School of International Culture and

Communication Studies

Waseda University

in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

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Acknowledgements

"Swift horse is common, but 'Bo Le' is very rare."

— Han Yu, Miscellaneous Discourse

It is an old saying in Chinese, which is similar to the English idiom "Pearls are everywhere but not the same as the eyes," meaning that someone has good judgments of talent. Although I am not talented enough, I appreciate that Professor Glenn Stockwell suggested that I should embark on the PhD study. On my PhD journey, I have found my self-discipline, research skills and capacities that I did not know I had. Without his encouragement and supports, the compilation of the journey would not have been possible. Moreover, Professor Glenn Stockwell's passion for research and education, as well as his care about students have always inspired me to be an academic like him.

My special thanks go to Lotte Group and Waseda University for offering me scholarships for my PhD study. Thank you for the support for allowing me to focus on my research. I am also thankful to my deputy directors, Professor Saori Sadoshima, Professor Sachiko Shudo, Professor Nobue Tanaka-Ellis, for their insightful feedback and sharp eyes that helped improve the dissertation. Besides, I would like to express my gratitude to Professor Wako Sunaoka for supporting my academic career path.

Thanks to all staff at the Graduate School of International Culture and Communication for always helping me when I had trouble and providing me with part-time jobs. My critical friend, Animeshs, thank you for providing honest feedback and being patient

Table of Contents

List of Tables

List of Figures

Chapter 1.   Introduction

1.1 Background of the study

Over the past few decades, computer assisted language learning (CALL) technologies have been widely used in language classes, which facilitate language input, output, interaction, affect, motivation, feedback, and metalinguistic knowledge not only in classroom but also anywhere and anytime (Thomas et al., 2012; Hampel & Pleines, 2013; Golonka et al., 2014). As Bax (2003) states the end goal of CALL is "normalisation," which means "the stage when a technology is invisible, hardly even recognized as a technology, taken for granted in everyday life" (p.23). While recently, although many language teachers are aware of the benefits of CALL, they rarely applied to their regular teaching practices (Uerz et al., 2018). As Thomas et al. (2012) assert, "the reality remains that the vast majority may use little more than a computer attached to a projector to display presentation slides" (p. 5).

To clarify the factors why in-service teachers reject new technologies, Ertmer (1999) categorizes into two main kinds of barriers, which are extrinsic and intrinsic. Extrinsic barriers are noted as a lack sufficient equipment, time, training, technical support, digital skills which could overcome by providing adequate training, technical support, and teaching collaboration (also Bax, 2003; Beatty, 2010; Levy 1997; Stockwell, 2009; Uerz, & Kral, 2018). However, intrinsic barriers, which include teacher beliefs about teaching and technology, confidence, existing teaching practice; and more crucial, unwilling to change, are unlikely to overcome as in-service teachers have their prior perceptions (Ertmer, 1999, p. 48). These aspects of the internal factors are unlikely to promote technologies to become normalized in language classes, especially in the teacher-centered contexts where educators make a decision about what and how

technology should be used.

1.2 Problem Statement

In Japan, efforts on enhancing CALL have been a crucial issue. The Japanese government has been emphasizing on technology use for educational purposes, for example, Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) has formulated a policy called "The Vision for ICT in Education" since 2010. However, most of the policies targeted at elementary and secondary education levels rather than higher education, and there remains a gap between policy and practice. According to PISA 2018, Japanese students use last digital devices (desktop, laptop or tablet) at school across OECD's 37 countries (see **Appendix A**). Existing research indicates that a lack of teacher training in CALL is one of the crucial influences on technology integration (Kessler, 2006; Stockwell, 2009; Stockwell & Hubbard, 2013), which can be seen in higher education as well. In AXIES's (2019) survey on Japanese universities, it shows that the main significant barriers to technology use are lecturers' lack of digital skills and motivation.

The so called 'digital immigrant' lecturers, who were born before the spread of technology (Prensky, 2001), determine course contents and select teaching materials and teaching approaches. It seems the normalization of CALL in a teacher-centered context do not predict teachers successfully adopt digital devices in practical everyday teaching. How do the university students, who are regarded as 'digital natives' (Prensky, 2001), expect teacher's use of technology in language class? How do in-service teachers perceive their new role to play? Understanding teachers' and students' perceptions of technology integration could bridge the gap between policy and practice that promotes

teacher's workplace learning. Furthermore, within CALL in Japan, there is very little in-depth research on the technology adoption in Chinese as a Foreign Language (CFL) at university classroom levels.

1.3 Purpose Statement

The study initially started as an ethnographic study to explore how Japanese university teacher and student perceptions of technology use in CFL courses affect their actual usage, investigating perceptions including attitude, motivation, belief, concern, value, and behavior around technology intergraded in CFL learning contexts. As the study unfolded, the range of factors underlying these perceptions proved to be far more complex than first thought, and as such, it slowly morphed into a study involving grounded theory to further understand the reasons behind the perceptions and actions regarding technology use in CFL. Through exploring the college teachers and students in CFL contexts it is believed that it will shed additional light on their interrelationships and provide new directions for how to promote CALL into foreign language pedagogy in higher education.

1.4 Significance of the Study

The study looks into university teachers' and students' perceptions of technology integrated into CFL courses through mixed methods. At this stage in the research, "perception" will be defined as including attitude, motivation, belief, concern, value, and behavior. Since longitudinal investigations of relevant studies remain scarce in the literature, this in-depth study aims to explore the interrelationships among teachers, students, and educational technology play in the higher educational setting. How

perceptions of technology use in CFL courses among Japanese university teachers and students affect their actual usage of technology were also observed. This study hopes to reveal the difficulties of educational technology used in the sociocultural context may provide new directions for how to promote CALL within foreign-language pedagogy. Teachers, teacher educators, researchers, and policy makers may gain valuable insight into the actual practices through the study, hopefully.

1.5 Outline of the Dissertation

Here is a brief description of each chapter in this dissertation:

To begin with, *Chapter 1 Introduction* outlines the background of the study, more specially, the statement of the current CALL issues in the Japanese contexts has been present that drew the significant of conducting this study.

Chapter 2 Literature Review provides a brief overview of educational issues of CALL integration in Japanese higher education, particular to Chinese as a foreign language (CFL) learning contexts. The chapter starts with the history of CFL education in modern Japan to see how the socio-culture shapes the CALL context, then, issues in CALL integration are presented. Previous studies into teachers' and students' perceptions around CALL implementation are discussed. It ends with a discussion of the difficulties in applying the existing theories/models to investigate CALL adoption for the research.

Chapter 3 Methodology describes the research design and procedure, along with the descriptions of the subjects and settings. Data collection and analysis methods are further presented. In the end, issues of reliability and validity, and ethical considerations are also discussed.

Chapter 4 Results presents both quantitative and qualitative data gathered from the multiple research instruments. Raw data was analyzed and reported based on the instruments respectively to provide an overall picture of the educational contexts and how the teachers and students perceived technology integration into CFL classrooms.

Chapter 5 Discussion outlines the main findings of the research to answer the research questions. In-depth discussion regarding the findings and previous studies are also compared, which hopes to broaden the knowledge in the CALL field.

Chapter 6 Conclusion summarized the significances of the study and provides implications for research, pedagogy, and administration. Limitations of the study are the pointed out, followed by recommendations for future research. Finally, personal suggestions for the CALL education are concluded in the final marks section.

Chapter 2.   Literature Review

2.1 Chinese education and technology integration in Japan

The purpose of this chapter is to give a picture of the historical and political backgrounds of Chinese as a foreign language (CFL) education in modern Japan. Understanding the history reforms, the educational systems, and the policies distributed by the Japanese government might gain insights into the language pedagogical movements, as well as help clarify the contexts which might affect the current practices; also, the concerns about CFL in Japan will be discussed in the end of this chapter.

2.1.1 History of modern Chinese language education in Japan

The origin of Chinese language education in Japan can be traced to Edo period (from 1603 to 1868), where Totsuji (唐通事, Chinese translators) learned Chinese for trading business in Nagasaki. However, due to the Meiji Restoration (明治維新) started from 1868, which is a event that restored Japan's political and social systems and led to rapidly changes in Meiji era, the development of Chinese language education was affected by the revolution as well. According to Rokkaku (1984), the modern history of Chinese language education in Japan can be marked after the Meiji Restoration and be categorized as two periods: (1) from1868 to 1945, and (2) from 1945 until today. The Chinese language education in the first phase was based on the learning methods rooted from Meiji era with a lack of methodology in linguistics and scientific language approaches, since the goal of learning Chinese at that period was for military purposes. While Japan surrendered in World War II, the relations between Japan and China changed, which means that the purpose of learning Chinese language changed as well. Since then, the Chinese language education has been treated as a foreign language and been set as a subject in higher educational systems, when is marked as the second period.

However, the position of Chinese language education was not as high as English, French, and German before the World War II in Japan (Rokkaku, 1984; Shao, 2005). Because of the Meiji Restoration that Japan's government adopted Western knowledge and technologies, the educational institutions started to teach English, French, and German as a foreign language. As Ando (1988, p. 2) described, learning English, French, and German was "a straight path," referring the languages was for elites to learn. On the contrary, learning Chinese was "a back street," which the learners learned it for practical reasons and ignored the culture. Similarly, Rokkaku (1984) states that not only the government but also private organizations regarded Chinese inferior to the other

three foreign languages. The reasons might because of the relations between Japan and China that made the impact on the language identity. As mentioned previously, since Meiji era, Japanese learners have learned Western languages in order to understand their culture; however, they learned Chinese for political, economic, and military reasons. For example, Japan colonized Taiwan between 1895 to 1945. Thus, the goals of studying Chinese were mainly for translation rather than for researching.

As such, the purposes of Chinese education related to the historical and political development might affect Japanese learners' attitudes toward learning Chinese as a foreign language. The policies of Chinese language in higher education in Japan will be further discussed in the next section.

2.1.2 CFL curriculum systems at Japanese universities

After the World War II, with the American occupation of Japan, the population of English learners increased dramatically, making English the most popular foreign language (Koshimizu, 2005). Since then, English education has been emphasized and set as a compulsory part of the curriculum. Not only the language, but also the American culture made a strong influence on the Japanese. On the other hand, Chinese had fallen into a more minor position until the Government of Japan and the Government of the People's Republic of China (PRC) established diplomatic relations form 1972. Because of the Chinese economic reform (or so the called the Opening of China) in the 80's, the Japan-China economic relations changed the Chinese education. It was from then that the learner of Chinese started to exceed French and German, becoming the most popular foreign language after English.

With the boom in the demand for Chinese education, the universities in Japan increased

Chinese language courses and Chinese majors from the 90's (Koshimizu, 2005). Based on various teaching goals, each university and department have their curriculums and policies. Except for Chinese majors, according to Gou (2007), there are mainly two types of curriculum systems; compulsory subjects and elective subjects. The former type requires students select one foreign language apart from English with one credit to eight credits, which is adopted by the majority of universities. The students who take Chinese as a compulsory subject have to take the courses two to four classes per week. The latter type of courses is not requirement, with which students are able to explore their interest by learning an additional language, and the class is given once a week. While there is no standard for CFL curriculum at universities in Japan, generally, the learning goals are (1) mastering in pronunciation, and (2) acquiring basic grammar and vocabulary, as each university uses different textbooks but mainly focuses on pronunciation and grammar (Guo, 2007).

With the promotion of Chinese language education in Japan, doubts were raised about if students have to choose Chinese courses as general subjects or specialized subjects, as students have been learning Chinese language for practical benefits instead of interests. At the same time, not only the curriculum systems but various issues on TCFL in university contexts were addressed, which will be touched on in the next section.

2.1.3 Challenges for Chinese language education in Japan

As has been discussed in the previous sections, the development of CFL education in Japan are affected by the history, policies, and curriculum systems, which shape the educational contexts. A number of researchers have address concerns in the teaching practices. As Koshimizu (2005) states,

Although the quantity and quality of students at universities might affect the Chinese teaching practices, we cannot deny that it is moving to a worst environment. (p. 13)

The key issues are:

(1) Inappropriate learning materials

With a lack of national curriculum for TCFL in higher education institutions, various publishers publish textbooks based on different teaching approaches, learning contents, and learning processes for different teachers and learners. Koshimizu (2005) notes that the common way of editing a textbook is a Chinese native speaker writes texts in Chinese, and a Japanese speaker writes the translations and instructions below the texts. Even Chinese teachers co-authoring a textbook, arguments on regional usages are in a debate (Machida, 2004). As Shi (1997) suggests,

> There are some textbooks published in Japan that with a lack of grammar explanations and practices, and are not appropriate for learners, even worse, are not scientific. Even though some of the textbooks are written by Chinese native speakers, there are still some grammar mistakes in the texts or composing dialects in the sentences. (p. 111)

Also, some universities require students to receive a Chinese proficiency certificate, and it might be beneficial for job hunting for students (Gou, 2007; Tao, 2014); thus, it becomes a trend that the textbooks are designed based on examinations, for instance, *Hanyu Shuiping Kaoshi* (HSK; a Chinese proficiency test administered by the Ministry of Education of the People's Republic of China.) and *Chugokoko Kentei Shiken* (held by a foundation called The Society for Testing Chinese Proficiency in Japan). Since

different institutions follow different curriculums, how textbooks could suit for varied class sizes, teaching time, learning contents and meet learner's needs is still a problem.

(2) Varied quality of teachers

With a growing number of CFL learners, there is a disproportionate number of teachers at universities, so researchers have called attention to teacher's quantity and quality (e.g., Guo, 2007). Koshimizu (2005) points out that universities tend to recruit part-time Chinese teachers rather than full-time teachers, because the historical reasons that Japanese emphasize more on western languages. Sunaoka (2017) addresses that most of the universities assign a Japanese native speaker and a Chinese native speaker as a pair to teach a Chinese class, expecting Japanese teachers to give grammar instructions and Chinese teachers to teach conversation skills. However, since most of the teachers are requited as part-time workers, who have to teach at various universities, there is a lack of communication between a pair of teachers (see also Guo, 2007). Also, it is common that two teachers use different textbook to teach a class. Moreover, the lack of Chinese teacher training programs and Chinese teaching certificate system in Japan might the problem as well. While China and Taiwan are promoting the certificates of Teachers of Chinese to Speakers of Other Languages (TCSOL), Japan's universities tended to select Japanese teacher who has experience of studying abroad to Chinese speaking countries (Koshimizu, 2005; Machida, 2004). Koshimizu (2005, p.13) reveals that most of the teachers are major in Chinese, literature, history, philosophy, politics, and economics; however, there is no teacher specializes in second language learning (SLA). The focus on researching in the promotion system leads teachers to lost sight of the importance of teaching. Guo (2007, p. 169) states that Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT) evaluates university teacher's academic achievement through research achievement rather than teaching achievement.

From these points of view, we can see that the inadequate teacher training, recruitment, and deployment in Japan's universities might make the quality of teacher vary.

(3) A lack of learning motivation

Sugimoto (2003) claims that Japanese university students regard university as a "leisure land," where "exhausted, both mentally and physically, by examination hell, they seek relaxation, enjoyment, and diversion in their university life" (p. 140). Students tend to see university life as a period of resting before entering to job market instead of a process of pursuing knowledge. The lack of motivation to enhance academic achievement can be seen by the reasons of leaning Chinese as well. As discussed above, Japanese learners of Chinese tend to learn Chinese because of the relations of Japan and China. When the relationship between two countries becomes tense, the number of Chinese language learners decreases (see Hu, 2014). The result is that students learn Chinese to protect self-identity instead of understanding the "opponent" (Sunaoka, 2017). A number of reports have also shown a lack of intrinsic motivation that a majority of the students choose Chinese as a second foreign language because "Chinese characters are easy to learn" and "it is easier to earn credits" because of the language similarity between Japanese and Chinese (Koshimizu, 2005; Hu, 2014; Sunaoka, 2017). Difficulties of learning a foreign language are determined by the similarities/differences between leaner's mother tongue and the target language. Although Japanese characters (Kanji) adopted Chinese characters (Hanzi) in the writing system, there are slightly differences between Shinjitai (the simplified Kanji used in Japan since 1946) and Simplified Chinese (the simplified forms of Chinese used in mainland China). Addition to this, the two languages differ in syntax and phonology completely. Wang et al. (2016) conducted a survey on 4,895 students among 44 universities in Japan to understand their language learning motivation. Based on expectancy-value theory, they found that

the majority of the students valued the importance and utility of the learning Chinese higher but regarded the expectancy lower. That is, the learners learned Chinese for external motivations and found they have to make more effort to master it, because Chinese is not as easy as they thought.

(4) Grammar-translation method for examinations

Grammar translation method (GTM) has been under severe criticisms, which is a classical approach to teach foreign language with "the explicit teaching of grammar rules and the use of translation exercises" (Lightbown & Spada, 2010, p. 200). While GTM is widely recognized that "students would probably never use the target language" (Larsen-Freeman and Anderson, 2011, p. 13), it remains a common method of TCFL in Japan (Hu, 2014). Sunaoka (2017) also points out that the textbooks published in Japan put a strong emphasize on grammatical syllabus, and there is a lack of interactive activities in classroom. The probable reasons are because foreign language education in Japan has been focusing on writing and reading, also, both teachers and students prefer using grammar translation method (GTM) as a main requirement, with which is a risk-free approach (Weschler, 1997) that teachers can avoid inducing incorrect rules and students can prevent making mistakes. To prepare for the entrance examinations for high school and universities, the GTM is further adopted to motivate students to memorize grammar rules and word lists. The examination-led systems bring Japanese students to place their goals on improving translation skills to pass the exams.

2.1.4 Socio-cultural issues in Japanese educational settings

Understanding how the society and culture shape people's attitudes and behaviours might help raise awareness of the educational issues in this context, as Muller and Brown (2012) states that:

> Successfully adopting and adapting innovations to local contexts takes time and effort, especially where inherent cultural differences may lead to resistances to, if not rejection of, apparently foreign ideas, approaches and/or methods; and the issues are increasingly complex as the scale and number of stakeholders grow. (p. 7)

The following significant issues have been discussed from the Japanese socio-cultural values.

Firstly, Japan has long been believed to be a collectivistic society in contrast to individualistic Americans since Benedict (1946) characterized Japanese as collectivism in his influential book, *The Chrysanthemum and the Sword.* Triandis (2001) defines collectivism as "people are interdependent within their in-groups (family, tribe, nation, etc.), give priority to the goals of their in-groups, shape their behavior primarily on the basis of in-group norms, and behave in a communal way (p. 909)." Although in the field of cross-cultural psychology, Japanese collectivism has been criticized as a stereotypical notion (e.g., Takano and Osaka, 1999) and Japanese is shifting to individualism (Hofstede, 2011), the concept is still valid that can be found in Japanese educational systems. For example, Sugimoto (2010) notes that institutions in Japan value psychological integration as a process of socialization to "generate a sense of group cohesion and achievement," as he explained:

> Schools in Japan have developed techniques to promote psychological uniformity and cohesion among pupils. It is standard routine in many subjects for a teacher to instruct an entire class to read a textbook aloud, in unison. This gives the class a sense of working together and makes it difficult for any child

to deviate from the set pattern. (p. 142)

This social pressure might cause individuals avoid conflict and embarrassment within a group, for instance, refraining from showing disagreement or to be too competitive among group members.

Secondary, on the contrast of the horizontal relationships among a group (e.g., colleague, classmate), Japan is recognized as a vertical society (e.g., boss to employment, parents to children) which is influenced by Confucianism. The top-down rankings based on age, gender, educational background, achievement, and wealth empower upper classes more authority (Nakane, 1970). For example, the *sempai-kohai* system (seniority system) can be found in workplace and school, as Sugimoto (2010, p. 142) reveals that "junior students (*kohai*) are expected to show respect, obedience, and subservience to senior students (*sempai*)," because seniors are regarded more experienced and holding a position for a longer period. In classrooms, teachers are viewed as the authority that students should obey without questions. As such, the hierarchical culture in educational contexts might give someone who ranks upper more power to decide teaching methods and materials; on the other hand, "lower class" might tend to follow the authority. Moreover, the relationships might make an impact on how people position themselves and perceive the others.

Thirdly, the concept of 'face' in Japan along with Asia countries is a metaphor implying a social image that people want to show in front of others. Goffman (1967) defines face as "an image of self-delineated in terms of approved social attributes" (p.5). Based on Goffman's (1967) work, Brown and Levinson (1978) further categorize two dimensions of face to explain politeness: 'positive face' and 'negative face.' Accordingly, the former

refers to one's esteem based on "the desire to be ratified, understood, approved of, liked or admired," while the latter refers to one's freedom of action based on the desire not to be intruded or obstructed by others, and Japanese culture is regarded as negative politeness orientation (Brown & Levinson, 1978, pp. 62). The 'facework' associated with social class, reputation, prestige, and honor can be found in different cultural contexts, such as 'losing face,' 'saving face,' 'giving face,' and 'building face.' Researchers in cross-culture study found that the concept of face (*mentsu*) in Japanese is different from other cultural backgrounds, even its origin is Chinese (*mien-tzu, lien*). According to Suedo (2004), Chinese *mien-tzu* "needs an audience for the loss," while *lien* "can be won or lost without having an audience present" (p. 293). That is, *mien-tzu* derives from interpersonal interactions and is closer to Japanese *mentsu,* which "evaluates not only the individual but also the entire group or community to which the individual belongs" (Suedo, 2004, p. 294). The facework can be seen in Japanese workplace and classroom, for example, students tend to be silent when risking a loss of face. For example, Nakane (2006) found that in the multicultural university seminar settings, the Japanese students tended to use silence as a strategy of 'saving face' to avoid making wrong answers, or 'giving face' (showing respect) for teachers (see also Sasaki & Ortlieb, 2017). The fears of receiving negative evaluation from others (see *shame and pride*, Sueda, 2014) can be found in Japanese institutional settings (see Haugh, 2005). That is to say, facework in Japan (i.e., *mentsu)* interrelates with individual and the membership in a group, with which the interrelationship might cause different behaviours.

Finally, the issue of native-speakerism in Japan has received increasing attention in foreign language education over the few past years. The concept of native-speakerism was first defined by Holiday (2006) as:

a pervasive ideology within ELT, characterized by the belief that 'native-speaker' teachers represent a 'Western culture' from which spring the ideals both of the English language and of English language teaching methodology. (p. 385)

It is assumed that native speaker teachers are served as a model of the target language and culture and are regarded more competent at teaching than non-native speaker teachers. The ideology can be found not only in ELT, but also other foreign language education from more aspects. Based on Holiday's (2015) framework, Houghton and Rivers (2013) broaden the definition by stating:

Native-speakerism is prejudice, stereotyping and/or discrimination, typically by or against foreign language teachers, on the basis of either being or not being perceived and categorized as a native speaker of a particular language, which can form part of a larger complex of interconnected prejudices including ethnocentrism, racism and sexism. Its endorsement positions individuals from certain language groups as being innately superior to individuals from other language groups. Therefore native-speakerist policies and practices represent a breach of one's basic human rights. (p. 13)

The ideology might make impacts on "many aspects of professional life, from employment policy to the presentation of language" (Holiday, 2006, p. 385), which can be seen from national/institutional policies (e.g., recruitment, promotion) to language classrooms (e.g., approach, language use). Native speakerism has come under criticism in Japanese context, as it affects how teachers are justified by each other and their

students. In Houghton and Rivers's (2013) book, they explored the phenomenon of native-speakerism in Japan and found that: native speakers were utilized as "linguistic/cultural resources" by Japanese teachers (Hashimoto, 2013), students prefer having native speaker teachers who they believe "have no accent, a better pronunciation, more words, phrases and idioms, and no grammar mistakes" (Derivry-Plard, 2013, p. 250), different hiring process (Hayes, 2013) and unbalanced workload (Houghton, 2013) between native and non-native teachers. Holiday (2006) suggests that:

> Such a perspective is native-speakerist because it negatively and confiningly labels what are in effect 'non-native speaker' 'cultures' as 'dependent,' 'hierarchical,' 'collectivist,' 'reticent,' 'indirect,' 'passive,' 'docile,' 'lacking in self esteem,' 'reluctant to challenge authority,' 'easily dominated,' 'undemocratic,' or 'traditional' and, in effect, uncritical and unthinking. (pp. 385-386)

In conclusion, the issues raised in Japan above suggest that *collectivism*, *hierarchy*, *face*, and *native-speakerism* might make an impact upon dynamic interrelationships between teachers and students in Japanese educational settings.

2.1.5 Educational technology integration in Japan

Considering the benefits that technology may bring into education, Japanese government has been promoting the use of technology in teaching and learning. The national policies for the integration of Information and Communication Technology (ICT) reported in The Vision for ICT in Education by Japanese Ministry of Education, Culture, Sports, Science and Technology (hereinafter MEXT) in 2011, with the belief that "fully utilizing ICT" may:

1. make classes more interactive and easy-to-understand, through teaching and learning among students themselves

2. reduce burdens of teachers and other school staff

3. enhance children's information literacy (p. 2)

Although the government has been promoting technology use in education, Program for International Student Assessment (PISA) in 2018 show that Japan has ranked last in terms of usage of digital devices (desktop, laptop, or tablet) at school across all 37 OECD countries. Research suggests that a lack of teacher training in CALL is one of the crucial factors in technology integration. According to a survey conducted by MEXT (2010), Survey Results Regarding the Informatization of Education reports that only 19.2% of teachers had received training on the ICT utilization for teaching. In order to equip pre-teachers with the competency to use ICT for educational purposes, MEXT (2017) decrees Education Personnel Certification pursuant Article 66-6, stressing that trainee teachers who plan to get teacher's license to teach at lower secondary, or secondary schools should take two credits from the compulsory course called "Operation of Information Technology (情報機器の操作)" at university. However, searching the syllabus regarding the course on Japanese universities' websites, the majority of the contents are related to the basic usage of computer skills (e.g., email, Internet, World, Excel, and Power Point). Moreover, to teach foreign language at university level in Japan, teacher license and the basic technology training are not necessary. From this point of view, it might be a gap between the policies and university teaching practices, where the university teachers might not have received professional and technical training on the utilization of technology. In addition to a lack of digital skills, the AXIES (2019) survey among Japanese universities identifies the

motivation among lecturers as the principal significant barrier to technology use. Therefore, understanding why university teachers are reluctant to use technology in teaching might help clarify the challenges for enhancing teacher's motivation of ICT integration in pedagogy.

2.2 Language education through technologies

2.2.1 Definition of technology

While technology integration in education has attracted a great interest in the field of SLA for a long time, the definition of itself remains unclear. The terms Technology-Enhanced Language Learning (TELL)/ Technology-Enhanced Language Teaching (TELT), and more particularly Web-Based Language Learning (WELL), Computer-Assisted Language Learning (CALL), or recently Mobile-Assisted Language Learning (MALL) are somehow ambiguous as them might overlap in some ways (Levy & Hubbard, 2005; Stockwell, 2012). While CALL is the most widely accepted one, researchers have defined it in various ways. Levy (1991, p.1) defines CALL as "the search for and study of applications of the computer in language teaching and learning" and Egbert's (2005, p. 4) definition: "learners learning language in any context, with, through, and around computer technologies," besides, Beatty (2010, p.7) suggests another definition that accommodates the changing nature of CALL as "any process in which a learner uses a computer and, as a result, improves his or her language." From this point of view, Hubbard (2009, p.1) question that "What do we mean by 'computer'?" in a critical way and further identifies that computer does not limit to merely desktop and laptop devices but also includes:

> [T]he networks connecting them, peripheral devices associated with them and

a number of other technological innovations such as PDAs (personal digital assistants), mp3 players, mobile phones, electronic whiteboards and even DVD players, which have a computer of sorts embedded in them. (pp. 1-2)

It seems that the terms are synonyms, but CALL is more likely to cover all of these concepts in terms of various devices, methods, and contexts. From a historical perspective, researchers have tried to divide CALL development based on phase and approach. The most well-known models are Warschauer's (1996) structural CALL, communicative CALL and integrative CALL (see 錯誤! 找不到參照來源。 and Bax's (2003) restricted CALL, open CALL and integrated CALL (see

Table 2). Bax (2003) makes an interesting argument on the gap between research and classroom practices, in which CALL is not "normalized" yet:

Normalization is therefore the stage when a technology is invisible, hardly even recognised as a technology, taken for granted in everyday life. CALL has not reached this stage, as evidenced by the use of the very acronym 'CALL' – we do not speak of PALL (Pen Assisted Language Learning) or of BALL (Book Assisted Language Learning) because those two technologies are completely integrated into education. (p. 23)

With the rapid development of technology, innovative devices (e.g., smartphone, tablet, smartwatch) come out, thus, the argument on the use of "CALL" remain under debate, as 'computer' appears to be more like a device whereas 'technology' seems to include a wider range of devices. Walker and White (2013) draw Warschauer's (1996) and Bax's (2003) models together and suggest move from CALL to TELL (see **Table 3**), as they "see technology not as assisting language learning, but as part of environment in

which language exists and is used (p.13)." From these points of view, computer or technology is regarded as "a device," "a tool," or "a tutor" depending on how human perceive and use.

Thus, in this study, the term *technology* is used to refer all types of digital devices and is not restricted to second/foreign language teaching and learning, nor merely for non-native speakers, but can be used in any educational context (e.g., teachers' networking). In other words, the use of *technology* will be explored in a broader sense, since it is unclear what, how, and where the teachers/students might adopt, also, their imagination of *technology* might vary from researchers' perspective, and they might be unconscious about their "normalized use." In saying that, in terms of hardware, technology is limited to devices such as a desktop or laptop computer, a tablet, or a mobile phone, although it does not exclude other devices such as electronic dictionaries. MP3 players were largely obsolete at the time of writing, so they have not been included in the definition of technology unless specifically referred to. The term *CALL* in this study adopts Hubbard's (2009) definition in a more focused sense to refer the use of these devices but for the particular purpose of foreign language learning and teaching.

Table 1 *Warschauer's (1996) three phases of CALL*

Stage	1970s–1980s: Structural CALL	1980s–1990s: Communicative CALL	21st Century: Integrative CALL
Technology	Mainframe	PCs	Multimedia and Internet
English-teaching paradigm	Grammar-translation and audio-lingual	Communicate [sic]language teaching	Content-Based, ESP/EAP

View of language	Structural (a formal structural system)	Cognitive (a mentally constructed system)	Socio-cognitive (developed in social interaction)
Principal use of computers	Drill and practice	Communicative exercises	Authentic discourse
Principal objective	Accuracy	And fluency	And agency

Note. Adapted from Bax (2003).

Table 2 *Bax's (2003) three phases of CALL*

Content	1960s–1980: Restricted CALL Language system	1980s–now: Open CALL System and skills	Normalisation: Integrated CALL Integrated language skills work Mixed skills and system
Type of task	Closed drills Quizzes	Simulations Games CMC	CMC WP e-mail
Type of student activity	Text reconstruction Answering closed questions Minimal interaction with other students	Interacting with the computer Occasional interaction with other students	Frequent interaction with other students Some interaction with computer through the lesson
Type of feedback	Correct/incorrect	Focus of linguistic skills development Open, flexible	Interpreting, evaluating, commenting, stimulating thought
Teacher roles	Monitor	Monitor/facilitator	Facilitator Manager
Teacher attitudes	Exaggerated fear and/or awe	Exaggerated fear and/or awe	Normal part of teaching— normalised

Position in curriculum	Not integrated into syllabus—optional extra Technology precedes syllabus and learner needs	Toy Not integrated into syllabus—optional extra Technology precedes syllabus and learner needs	Tool for learning Normalised integrated into syllabus, adapted to learners' needs Analysis of needs and context precedes decisions about technology
Position in lesson	Whole CALL lesson	Whole CALL lesson	Smaller part of every lesson
Physical position of computer	Separate computer lab	Separate lab—perhaps devoted to languages	In every classroom, on every desk, in every bag

Note. Adapted from Bax (2003).

Table 3 *Walker and White's four phases of CALL and TELL (2013, p.10)*

Approach	Structural/ restricted CALL	Communicative CALL Open CALL	Integrative CALL	TELL
Technology	From mainframe to mobile	PCs	Multimedia, internet	Mobile devices, tablets, multiplayer, games, virtual worlds
English-teaching paradigm	Grammar-translation and audio-lingual	Communicative language teaching	Content-based ESP/EAP	Communication, interaction
View of language	Drill and practice	Communicative exercises	Authentic discourse	Normalized
Principle objective	Accuracy	Fluency	Agency	Autonomy within community
View of learning	Behaviorism	Constructivism	Social constructivism/situated learning	Connectivism

Role of technology	Tutor	Tutee	Mediational tool	Environment, resource

2.2.2 The interrelationships among technologies, students, and teachers

A lot of research in SLA has widely discussed "role" of teacher and learner, which Wright (1987, p.5) sees teaching and learning as social activities and defines "role" as:

      (1) the work done and job-related activities,

      (2) the relationships and communication one has with others, and

      (3) beliefs and attitudes.

It is widely acknowledged that technology has profoundly changed the traditional learning environment and now plays a significant role in the teaching and learning process (Ellis, 1995; Chinnery, 2006). Nevertheless, the roles and relationship among educator, learner, and technology itself remain unclear in some regards, which should be taken into reconsideration, comparatively little is known about how educator interact with technology (Zhao & Tella, 2002; Thomas & Reinders, 2012). Although Levy and Hubbard (2005, p. 146) suggest research and development shift from CALL-centered to "computer is a neutral delivery system or 'just' a tool" where "the computer, the language learner, and the language learning objectives are at the heart of the matter" (see **Figure 1**), teachers usually are the one who decide how technology should be used. Especially, in teacher-centered contexts where "the teacher acts as an authority, supervising the process of learning acquisition and serving as the expert in a highly structured learning environment" (Tondeur et al., 2017, p. 557), teachers play a key role in technology integration. Stockwell (2015) observes that "a complex interrelationship has emerged between technology, teachers and learners, where each has the potential to

influence the others" (p. 362) (see

Figure 2). How teachers perceive technology and what they use to teach has a significant impact on their students, and consequently, students' reactions might affect teachers' technology usage patterns (Lam & Lawrence, 2002; Wiebe & Kabata, 2010; Lai et al., 2016). With the use of technology, teachers have new roles, including technological, strategic, and pedagogical support (Stockwell & Hubbard, 2013). Therefore, understanding role relationships between teacher and learners, learners, and learners, or even teacher and teacher in the pedagogical process might help clarify the factors influence their choice of technology use.

Figure 1 *A simple conceptualisation of the CALL perspective (Levy & Hubbard, 2005, p. 146)*
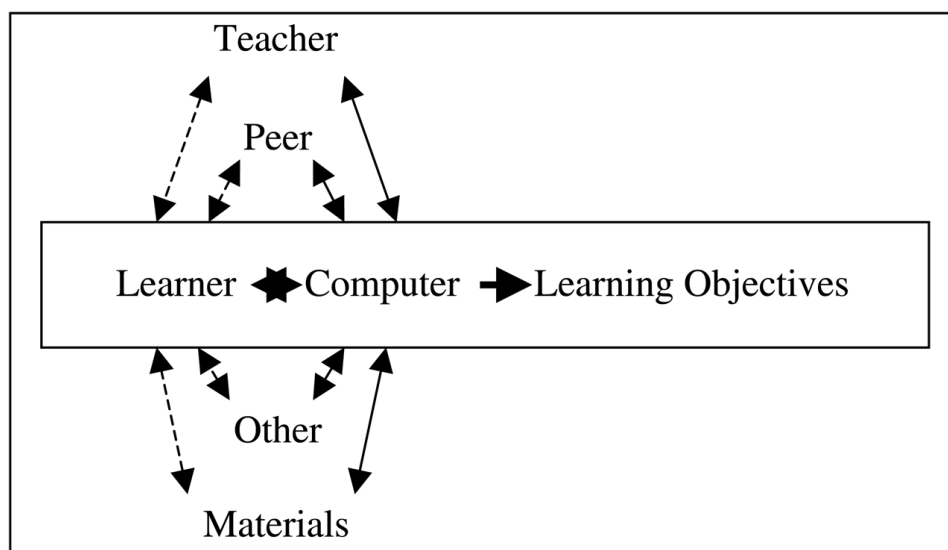
Figure 2 *The interrelationship between technology, teachers and learners (Stockwell,*

2015, p. 364)
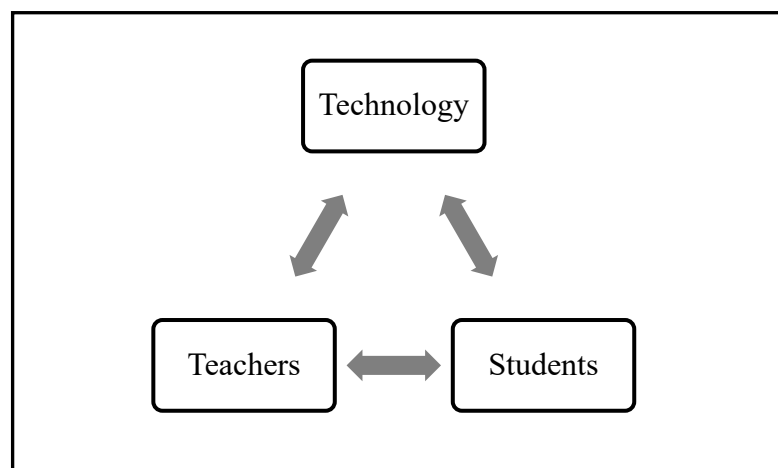
2.2.3 Features and use of LMS in foreign language education

Learning Management System (LMS) is a web-based platform that allows instructors

to plan, track, evaluate, report learning process which is widely used for companies to

train employee and for higher educational institutions. According to Ellis (2009, p.1),

an LMS includes the following features:

     (1) centralize and automate administration

     (2) use self-service and self-guided services

     (3) assemble and deliver learning content rapidly

     (4) consolidate training initiatives on a scalable web-based platform

(5) support portability and standards

(6) personalize content and enable knowledge reuse

There are two types of LMSs: open source and commercial LMS. Open source LMSs (e.g., Moodle, Sakai, Open edX, Google Classroom, Canvas) are usually free that allow add-ons and plug-ins to expand the system for customization, but it requires high technical skills to build and maintain. On the commercial LMSs side (e.g., Blackboard), literally, they are fee-based and may charge more if additional functions/options are needed, but the vendor may provide support and training to help solve technical problems based on different price for the services. Stakeholders can choose the LMS based on their needs in the LMS market.

Taking advantage of LMSs, teachers and students are able to communicate through the system by using the built-in (or plugin) asynchronous tools (e.g., discussion forums, email) and asynchronous tools (e.g., text chat, video conferencing, collaborative document editing). Many researchers and instructors in SLA have found LMSs are useful for language education, since they provide and virtual environment for learning communities basing on social constructivist theory (Brandl, 2005; Hampel, & Pleines, 2013). Also, LMSs automatically store users' log reports (e.g., access time, time spent, IP address, devices, browser history). Given the effectiveness that LMS can have, Stickler and Hampel (2010) apply Moodle based tools for a German course to record users' access combining with several Computer Mediated Communication (CMC) tasks (e.g., blog, wiki, quiz, forum, videoconference), in order to compare learners' actual behaviors and self-evaluation. They find that learners' choices of tools are affected by their preferences and learning styles, for instance, student who tends to engage in blog prefers learning individually and focuses more on writing skills. Stickler and Hampel

(2010, p. 70) also suggest that "it is more conductive to students' learning to combine online tools with specific curricular aspects and to allow different learners to choose the tools and activities that suit their learning style and objectives." Similarly, Cheng and Chau (2016) also found a significant relationship between students' preferred learning style and their online participation in an LMS setting.

To put in briefly, an LMS serves administrators/teachers to manage, create online courses and materials, as well as to evaluate learners learning processes, also, it provides learners access to the contents. It is an ideal online platform for interactions not only for teacher-students but also student-student (e.g., peer's feedback). More important, since it is for "learning" management rather than "teaching" management, LMS emphasizes the contribution from learners, expecting learners' self-management in learning processes and sociocultural learning with peers following pedagogical guidelines. Students' learning styles and motivation determine the way how they choose/use the online materials, but overall, still, the course instructor is usually the one who selects materials and designs online activities for the students.

2.2.4 Design and implementation of educational technology

From design to implement online learning materials, the principles can vary from one researcher to another depending on contexts. Previous studies have shown how technologies can be applied to support language skills/aspects, for instance, vocabulary, grammar, listening, reading, speaking (see Golonka, Bowles, Frank, Richardson & Freynik, 2014). Generally, researchers suggest that the foundation of online learning should be rooted in SLA theories. That is, technology is to "assist" language educational processes, relying heavily on teaching approaches. Hampel (2006, p. 108) notes the three levels of theory, design and implementation process for online language learning (see **Table 4** *Three-level design and implementation process for online tasks (Hampel,*

2006, p. 108)), which are (1) approach, taking SLA theories, sociocultural principles and the online environment into account; (2) design, referring "the courses that the tasks are embedded in, the type of tasks used as well as their role in these courses, and the assumptions about what roles students and teachers are likely to play in the learning process"; and (3) procedure, examining "how the tasks are implemented in the virtual 'classroom,' taking into account the resources used by the teacher, the interaction that takes place, and strategies used by both teachers and learners."

Table 4 *Three-level design and implementation process for online tasks (Hampel, 2006, p. 108)*

Approach	SLA theories
	Sociocultural principles
	Affordances of online environment
Design	Function of tasks within course
	Syllabus
	Type of tasks
	Learner/tutor roles
Procedure	Implementation in the classroom

However, again, this framework may be appropriate for task-based teaching with technology but not useful for other teaching methods or pedagogical designs. Moreover, to integrate technology into teaching practices, Levy and Stockwell (2006) note a successful implementation should have "clear pedagogical objectives in mind, knowledge of the technological options and an awareness of the needs, goals and skills of the learners" (p. 107). To sum up, knowing how technology can be utilized to enhance teaching/learning play a key role in successful integration, however, the core should be language education itself. From designing to implementation, it should stick with SLA theories depending on contexts (e.g., learner's goals, teaching approaches,

curriculum designs, environments).

2.3 Issues of CALL integration

2.3.1 Contextual factors

Given that different individuals have different perceptions of technology, in particular, teachers' and learners' views of educational technology, how they use and perceive technology make the pedagogical outcomes vary in classroom practices. However, the factors affecting perceptions of technology integration for language learning/teaching purposes are complex, which can involve from individual aspects to environmental aspects. Researchers suggest looking into the complexity of factors from contextual aspects in order to give a full picture of the view. Emphasizing the key role that context plays in shaping teachers' and students' perceptions of educational technology, Stockwell (2012) breaks down three levels of diversity in CALL that individual, institutional, and societal factors affect how CALL can be implemented and used. As can be seen in **Table 5**, Stockwell further stresses that "the levels do not exist independently of one another, but rather each one both shapes and is shaped by the others to form the complex matrix that is the language learning context" (p. 165). In other words, individuals (i.e., teacher and learners) who are grouped into an institution, so they are necessary affected by the institutional factors, on the other hand, society where the institution located are shaped by the individuals.

Table 5 *Levels of diversity in CALL (Stockwell, 2012, p. 165)*

Level	Aspects of diversity
Individual	Learner background, skills, and goals
	Teacher experiences, skills, and teaching styles
	Attitudes towards technology for language learning

	Technological affordances
	Classroom dynamics
Institutional	Educational policy and curriculum
	Institution-wide technology use
	View of teacher training
	Technological and financial support
	Attitudes towards specific needs for language learning
Societal	Availability and costs of technology
	Technology standard
	Access to relevant information and organizations

The CALL context constructed by these contextual factors have attracted attention in CALL research recently. Researchers suggest looking deep into the CALL contexts as a variety of components are connected, from cultural, social, political, and institutional components to teaching practices and students' interaction. Blin (2016) termed these contextual aspects "CALL ecosystems," which consist of:

> interacting components including language learners, teachers and other users of the target language, technological devices, applications and platforms, and multimodal material/semiotic artefacts and resources, all of which participate in a language learning/use activity, as well as the social processes and semiotic practices that characterize the way the human actors interact with one another and with other components of the system. (p. 39)

These range of factors highlight the CALL context in which language education occurs influences the interrelationships between learners, teachers, and technology, furthermore, individuals' perception shaped by the context make heavy impacts on their adoptions, selections, and implementations of technology use.

2.3.2 Affordances and perceived barriers of technology

Gibson (1979), a psychologist who made up a term *affordance*, suggests "the complementarity of the animal and the environment" (p. 127) from ecological perspectives. Later on, Gaver (1991) uses the term to explore the way in which technology can be used depending on potential of a technology and human's perceptual information. Gaver outlines an illustrate to categorize affordances into four dimensions (see **Figure 3**, suggesting that "affordances exist whether or not they are perceived, but it is because they are inherently about important properties that they need to be perceived" (p. 80).

Figure 3 *Four dimensions of affordance*
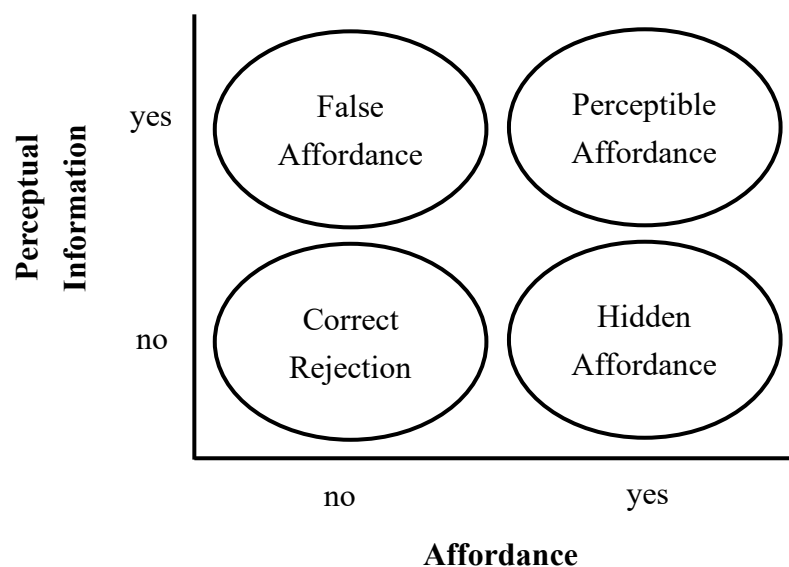
Note. Adopt from Gaver (1991, p. 80). *Perceptible Affordances* (perceptual information available for an existing affordance), *Hidden Affordances* (no information available for an existing affordance and must be inferred from other evidence), *False Affordance* (a nonexistent affordance people may mistakenly try to act), *Correct Rejection* (no affordance nor any perceptual information suggesting it).

According to Beatty (2010), he refers *affordances* to "the visual clues that an object gives to its use as well as what it is capable of doing in terms of both intended and

unintended functions" (p.50) and further makes up a word "*misaffordances*" to emphasize the distracts from an intended use. Stockwell (2012) highlights affordances in CALL contexts implying "how technology may help or hinder the learning process" (p. 7). For example, the mobility of a smartphone can be useful for learners to carry out and learn with it "anytime, anywhere," on the other hand, the design itself (e.g., smaller screen) may prevent learners from engaging in learning activities with it, as Stockwell's (2010, 2015) studies notes that the majority of learners tended to perceive smartphones as a private tool (e.g., for social networking and email) rather than a learning tool. The notion of affordances underlines how technologies may be used appropriately or misused by the user, also, the affordances learners/teachers perceive make foster or hinder their usage.

Although technology may provide "effectiveness" into language educational contexts, it should be noted that there exist some issues perceived to be barriers prevent successful integrations. Stockwell (2022) categorizes three main issues in MALL, but it can be applied to understand general issues of educational technology integration, which are physical, psycho-social, and pedagogical issues. Accordingly, *physical issues* are characteristics of the devices, for example, screen size, input methods, storage capacity, processor speeds, battery life, compatibility, network access. *Psycho-social issues* are related to user's views of the devices, willingness/resistance to engage in activities with technology, attentional involvement, distraction, addictive effect, also, how user perceives other's views in the social context. *Pedagogical issues* related to task/activity designs for second language learning and teaching which involve teaching approach and learning methods. From pedagogical perspectives, it should be kept in mind that when integrating technology into teaching/learning processes, the affordances can be perceived upon technology designs and functions. The activity

designs and instructions also play a significant role in the usages. Since different users may perceive learning/teaching through technology in various ways based on individuals' experiences, skills and digital competences, they are likely to have different usages.

2.3.3 Teaching through technology

2.3.3.1 New roles for teachers

Traditionally, in language classrooms, teachers are regarded as "manager" "instructor," who are all-powerful, all-knowing, taking control over learning process (Wright, 1987). For example, selecting materials, evaluating achievement, providing instructions and feedbacks. While research in CALL filed suggest there is a shift from teacher-centered to student-centered instructions that place learners at the center of the classroom, the traditional roles of teacher do not change dramatically with the use of technology. Although teachers can take advantage from technology, they seem to play more multiple roles in CALL environment.

Inspired by social psychology, Hubbard and Levy (2006) propose a role-based framework for CALL education, outlining two main roles: functional roles and institutional roles. Functional roles refer practitioners (apply knowledge and skill), developer (create something new or revise/adapt existing work), researcher (discover new information or pursue evaluation), trainer (build CALL knowledge and skills in other). Institutional roles include pre-service teacher, in-service teacher, CALL specialist (who has "additional skills and knowledge relevant to CALL" compared with classroom teacher) and CALL professional (who has "relatively deeper knowledge and more elaborated skill sets in multiple areas" (pp. 14-15). Hubbard and Levy (2006) note the framework is a pre-theoretical and practical concept to help clarify knowledge and

skills of CALL educators for professional development.

Building on this role-framework, literature keep exploring teacher role in dynamic CALL contexts, describing teacher roles by using metaphors, for instance, cheerleader, facilitator, creator, observer, designer and so on. As Lai (2015) points out that teachers should provide student with affection support, capacity support and behavior support as using technology for out-of-class language learning, especially, selecting appropriate materials for the learners. Romeo and Hubbard (2010) stress the roles teachers play in providing students with technical, strategic, and pedagogical support (see also Stockwell & Hubbard, 2013).

It seems that classroom teachers are expected to equip with not only pedagogical but also technical, phycological, social, researching knowledge and skills to integrate technology successfully in teaching practices. These new roles, or say, challenges for teachers may cause stress emotionally, financially, or gain workload and time especially for in-service teachers who have limited use of technology for teaching. On the other hand, the new roles for teachers may affect national/institutional policies that train pre-service teachers.

2.3.3.2 Teacher education for CALL

As has been mentioned previously, teachers have to take multiple roles in using technology for teaching practices. What specific knowledge and skills teacher should receive, and how the contents should be taught through CALL training have attracted attention in CALL teacher education recently (Son, 2018). Regarding competence Hampel and Stickler (2005) propose a pyramid of skills (see

Figure 4) ranging from lower level skills (e.g., basic computer skills, competence to

use a specific software, dealing with constraints and affordances of the software) to higher level skills (e.g., creating a community, facilitating communication as well as creativity, choice, selection and development of own teaching style).

Figure 4 *Skills pyramid (adapted from Hampel & Stickler, 2005, p. 317).*
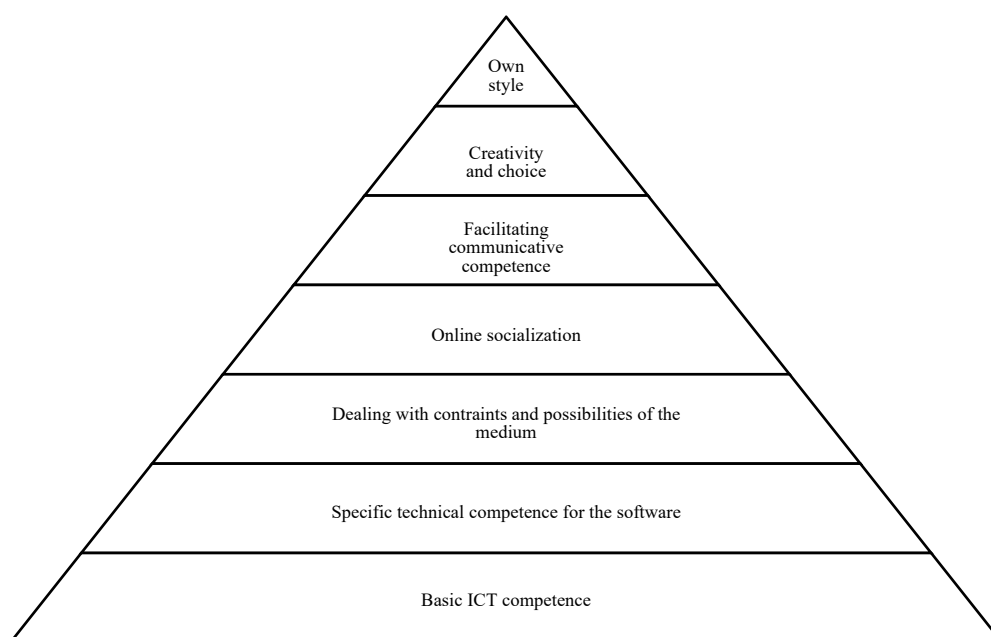
In order to help teachers to develop these competences, Son (2018) suggest providing different types of training (formal and informal learning) to different teachers (pre-service and in-service teacher) as their needs vary. However, previous studies measuring effectiveness of teacher training have found a gap between teacher education and teaching practices. For example, Stockwell (2009) conducted a seminar with self-direction strategies to train the teachers to teach themselves to acquire CALL knowledge, however, the results show that the participated teachers preferred using the existing resources rather than new methods and had difficulties to assess to academic CALL journal. The fundamental problems may be insufficient policies to support

teacher development in CALL education. According to Stockwell (2009),

> [T]he reality is that it is still difficult to access CALL education for many, leaving the responsibility to fall upon these teachers to educate themselves. This may be due to a lack of policy regarding CALL at a faculty or institutional level, a lack of awareness of the existence of professional courses, or even a lack of financial resources or linguistic skills to take part in such courses. (p. 99)

The situation has not changed a lot after almost a decade, a lack of professional trainers in institutions is problematic as well, as Doshmanziari and Mostafavi (2017) state:

> One of the issues that our educational system, especially educational department is facing is the lack of teachers and educators and also administrators and authorities' familiarity with educational technology and its employment in the process of teaching and learning and this problem like other issues roots in our education system. (p. 46)

With the increasing awareness of helping teachers integrate technology into classroom practices, researchers suggest providing teacher with institutional support, teaching community, ongoing professional development, supportive policies (Ottenbreit-Leftwich et al., 2018; Ertmer & Ottenbreit-Leftwich, 2010; Son, 2018).

2.3.4 Learning through technology

2.3.4.1 New roles for learners

Wright (1987) regards language teaching and learning as social activities which are

dynamic; thus, teacher and learner roles change because they are flexible and dynamic within the classroom practices. As teachers' traditional roles are considered as "manager" of pave learning conditions and "expert" of knowledge, learners are regarded as recipients that follow teacher's directions. In Larsen-Freeman and Anderson's (2011) book *Techniques and Principles in Language Teaching*, they describe teacher and student roles based on the language teaching approaches. In the third edition, they added a new chapter on technology uses as they viewed "technology as providing teaching resources" and "technology as providing enhanced learning experiences" (p. 199). Emerging technological approach, the role of teacher and learners are illustrated:

> The teacher's role is to plan activities that students accomplish via technological means. Then the teacher monitors their work and guides the students as they learn the language. The students' role is to be actively involved in using the language, intaking risks with the language by connecting with others, and in exploring information via the target language. Students help each other to learn. (p. 208)

It seems that with the use of technology, learners are able to manage their learning patterns and take more responsibilities for their learning (Hubbard, 2004; Murphy, 2011; Stockwell, 2015). In particular, learners can take the pedagogical advantages of technology (e.g., interaction, feedback, monitoring and recording of learning behavior and progress) for language support to develop learner autonomy (Reinders & Darasawang, 2012). Ushioda (2011) also suggest leaners autonomy can be enhanced through social interactions through technology. The potential advantages of technology can help create a learning environment where place leaners in the center of language

learning process, taking control over their learning.

However, in Lam and Lawrence's (2002) study, they found the roles of teacher and leaners in the CALL environment did not change dramatically as literature has addressed. In the computer lab setting, the classroom teacher-learner roles remained traditional since the learners still relied heavily on the teacher as the authority of knowledge, but the reliance had shifted from teacher-imposed to student-initiated. The students reported their new "managerial roles," with which they had more freedom and power to pave their own learning process. They drew an interesting conclusion:

> We found that the use of computers led to the redefinition of some of the traditional roles, but overall the teacher still acted as the teacher and the students still behaved as students. (p. 296)

Learners' role may change in a technology emerged environment, but it is not the matter of technology itself, again, how teachers design, plan, adopt into their language teaching approach, how learners adapt technology into their learning process, also, how teacher-learner interact with the use of technology, these dynamic relationships make impact on their roles.

2.3.4.2 Learner training for CALL

Learner training has been attracted attention in CALL literature for almost two decades, as previous studies suggest the importance of learner training with which could have led to more "effective" results. According to Hubbard and Romeo (2012), learner training is "a process aimed at promoting the development of technology competence specially for the purpose of second language acquisition" (p. 33). In the early literature,

technical training was the main focus, for instance, educating learners in the use of a certain software/application and computer skills. While technical issues are essential to learner training, it is obvious that technical competences do not guarantee leaners can successfully use technology for learning purposes. Teachers are often responsible for providing students with trainings in CALL practices; however, with the assumption that young generation are "digital natives" (Prensky, 2001), today's teachers have a common myth that learner training is no longer necessary as they assume students have better use of technology than teachers (see Stockwell & Reinders, 2019). In Stockwell's (2008) study, it is found that the university students in Japan tended to use their mobile phone and PC as a private tool (e.g., SMS, email, games) rather than a learning tool. It shows that the so-called "digital natives" were not prepared for engaging in learning activities through smartphone though they had adequate technical skills. Even though students know how to use a device/software, they may not sustain their learning through it to achieve their goals of language learning.

Romeo and Hubbard (2010) propose a framework for learner training, suggesting that not only technical training, strategic and pedagogical training also make impact on the learning outcomes. As Hubbard and Romeo (2012) clarify, the concept of strategic training for CALL is built on Oxford's (1990) work for strategies in non-CALL environments, which include cognitive, metacognitive, social, and affective strategies. These strategic training should be provided in CALL environments as well, in order to assist learner to adopt technology in their learning processes. For example, using electronic glossary (Liou, 2000) and interactive e-books (Smeets & Bus, 2014), as well as supporting peers in online learning community (Kim, 2014). According to Hubbard and Romeo (2012), since learners seem to have more choices in CALL environments, they should receive pedagogical training as a teacher, so they are able to have a better

determination on technology use, moreover, to "determine specific learning objectives and understand why to use certain techniques and procedures to achieve." It should note that the three dimensions of training are integrated, which help learners know how (technical training), what (strategic training), and why (pedagogical training) technology can be adopted and adapt in their learning processes. Moreover, Hubbard and Romeo (2012) suggest taking timing, form, intensity, and learner diversity into account. It is usual to provide learning training from the starting point with an intensive tutorial session, but according to Hubbard's framework, it should be an ongoing process that combined with the three types of training cyclically. Accordingly, the form of training can be conducted inductively or deductively, and even blending the two. In inductive training, learners are able to explore a CALL material's use by themselves or with peers, then, teacher check if their interactions are as his/her expected and provide with additional supports if not. On the other hand, deductive training is provided with explicit instructions, followed by teacher's guidance with the use.

Since learner training takes time and may take up class time, how often and how long it should be spent has been an issue, as it has been found that it is more effective to provide learners at lower levels of language proficiency with "less complex" and "more familiar strategies" because "their attention is focuses so heavily on conscious manipulation of language itself" (Hubbard & Romeo, 2012, p. 40). In addition to language proficiency, "learner diversity" (Hubbard & Romeo, 2012) or "learner variables" (Griffith, 2008) should also be taken into consideration, which includes motivation, age, learning style, personality, gender, strategies (strategy use), metacognition, autonomy, beliefs, culture, aptitude. In line with second language teaching, teacher should provide training in accordance with these characteristics that make each leaner different. These will be discussed in the following sections.

2.4 Teacher perceptions of educational technology

As mentioned above in Chapter 2.3.3.2, the new roles for teachers in technology-enhanced language learning environments have been suggested in literature. However, how teachers perceive their role determines whether they take charge in their new responsibilities for educational technology use. According to Mozafari and Wray (2015), teacher perception is defined as "the thoughts or mental images which teachers have about their professional activities and their students, which are shaped by their background knowledge and life experiences and influence their professional behaviour" (p.116). Thus, looking into how teacher perceptions were shaped may help better understand their concerns about the new roles, and hopefully, facilitate their professional performance. In this section, teachers' perceptions in terms of their beliefs, attitudes, teaching styles, affective around educational technology will be discussed.

2.4.1 Teacher change and resistance to change

According to Ertmer (1999), attention in CALL literature has moved "from the adoption decision (to use or not to use computers) to the implementation process (when and how to use computers in meaningful ways)" (p. 48). As we have known that technology adoption is not the end goal, but the means for assisting language learning goals as the terminology of *CALL* is defined. Nevertheless, even after around two decades, there remains teachers who are unwilling to integrate technology into their teaching practices. While technology has changed the traditional classroom, why "traditional teachers" reject changes remains unclear (Stockwell & Reinders, 2019; Thomas & Reinders, 2012). Regarding a wide range of factors hinder teacher's adoption and adaption, Ertmer (1999) categorizes two main barriers to change, including first-order and

second-order barriers. Accordingly, the first-order (extrinsic) barriers refer to the lack of resources, accessibilities, equipment, time, training, support provided in teaching environment. These extrinsic factors are incremental but can be easily observed and overcome with the help by institutions (e.g., providing funds, technical support, adequate training). However, the second-order (intrinsic) barriers are fundamental and personal, referring to teachers' views of technology integration and affective factors, which are "typically rooted in teachers' underlying beliefs about teaching and learning and may not be immediately apparent to others or even to the teachers themselves" (Ertmer, 1999, p. 51). This indicates the difficulty to measure and to eliminate teachers' intrinsic barriers, yet, these barriers overwhelm the extrinsic barriers, as Ertmer notes that "even if every first-order barrier were removed, teachers would not automatically use technology to achieve the kind of meaningful outcomes advocated here" (p. 52).

Since there is an interrelationship between teacher beliefs and behaviours, as Guskey (1986) suggests, teachers change their beliefs through changing their practices based on students' outcomes (see **Figure 5**). As per Stockwell's (2009) study, he trained four language teachers with minimal CALL experience at a Japanese university to teach themselves to integrate CALL into their teaching practices. Initially, the four teachers were expected to use CALL, anticipating its benefits; however, they gave up the usage or had limited usage eventually. It was found that the teachers tended to adopt the tools and resources they were already familiar with (e.g., free ready-to-use web-based resources, email) rather than adopt/learned new methods. This can be seen in Howard's (2013) study that he found the teachers' resistance to integrate innovate technology into their existing teaching was caused by uncertainty and risk perception. As the teacher revealed in the interviews he conducted, he found that the teachers perceived using technology high risk and low benefits as the teachers stated:

It's [technology] something I have not used, other than taking the class to the computers to do work on spreadsheets. Um, so yeah, it's not something I am familiar with or part of my normal teaching style. So it would be a risk in that sense. (p. 367).

The teachers perceived risk and anxiety with the use of technology not only because a lack of knowledge and use of technology but also the values they perceived technology in teaching (e.g., a threat to "normal teaching style"). These negative affective responds make significant impacts on teacher resistance. Similarly, Ertmer et al. (2012) found that teachers' existing beliefs and attitudes toward CALL have prevented them from implementing technology in teaching and learning (see also Kim et al., 2013; Tondeur et al. 2017). These show that teachers' prior experience, pedagogical considerations, and motivation in terms of intrinsic factors have a crucial effect on educational technology use.

Figure 5 *Model of Teacher Change (Guskey, 1986)*
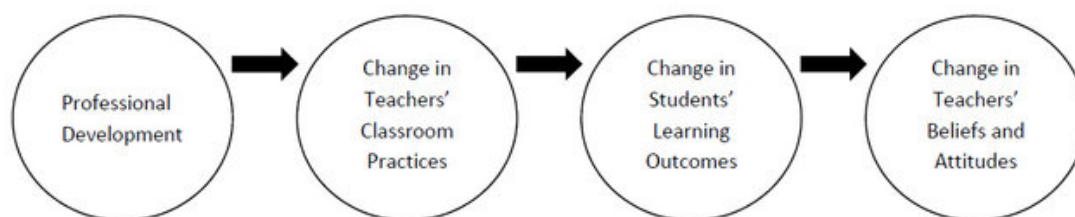
The underlying assumptions are noted by Lam and Lawrence (2002), teachers perceive their roles are taken away from technology-enhanced contexts. As they mentioned, there is a common belief that "learners often know more about the technology than the teacher does," and thus, "the teacher's expertise in the subject area may also be

threatened" (p. 298). That is to say, teachers, the so-called "digital immigrants" (Prensky, 2001) regard their students as "digital natives" (Prensky, 2001) who are experts of technology. This "myth" (see Stockwell & Reinders, 2019) may transfer the roles of teacher-student, as teachers become "learners of technology" and students may "teach" teachers how to operate a device or software. Moreover, students are able to access to information through digital technologies like internet platforms, social media, and mobile devices which are beyond teachers' control. Thus, teacher's authority is challenged by technology because of the threat to the traditional role as a giver of knowledge. How teachers perceive their role and student's role in teaching settings is dynamic, showing these intrinsic factors are crucial but relatively difficult to examine than extrinsic factors. Most of the previous studies were conducted through surveys, interviews, or self-reports; however, how much we can rely on the data if teachers are unwilling reveal their real voices? It may be difficult to admit their authority has been taken by "technology." Exploring the reasons of teachers' resistance to educational technology through longitudinal observation may help understand the barriers they are facing, furthermore, to help prepare for teacher education as well as professional development.

2.4.2 Teaching styles and classroom management styles

Some teachers embrace new technology to teach while some resist. Since all teachers have different preferences, Zisow (2000) states that:

> I am convinced that the greatest factor affecting whether a teacher does or does not use technology in the classroom, is teaching style. Technology is merely a tool. Whether it is used or not depends on a teacher's motivation and desire to use new tools. (p. 36).

It seems teaching style is the crucial factor determining teachers' willingness to adopt new methods and the usage, yet, the term *teaching style* is a wide range of concepts which has not reached an agreed definition. It can be seen as a synonym of *teaching method* or *technique*, but specifically, *teaching style* refers to "style as a predilection toward teaching behavior and the congruence between an educator's teaching behaviors and teaching beliefs" (Heimlich & Norland, 1994, p. 34). In line with this, Grasha (1996) see teaching style as the consistent behaviors associated with interactions with students:

> Our teaching style represents those enduring personal qualities and behaviors that appear in how we conduct our classes. Thus, it is both something that defines us, that guides and directs our instructional processes, and that has effects on students and their ability to learn. (p. 1)

Noting the diversity of individual differences, Grasha (1996) categorizes five main teaching styles which are related to teacher roles in the following table:

Table 6 *Grasha's five teaching styles (adapted from Grasha, 1996, p. 154)*

Teaching style	Description
Expert	Possesses knowledge and expertise that students need. Strives to maintain status as an expert among students by displaying detailed knowledge and by challenging students to enhance their competence. Concerned with transmitting information and ensuring that students are well prepared.
Formal authority	Possesses status among students because of knowledge and role as a faculty member. Concerned with providing positive and negative feedback, establishing learning goals, expectations, and rules of conduct for students. Concerned with the correct, acceptable, and standard ways to do things and with providing students with the

	structure they need to learn.
Personal model	Believes in "teaching by personal example" and establishes a prototype for how to think and behave. Oversees, guides, and directs by showing how to do things, and encouraging students to observe and then to emulate the instructor's approach.
Facilitator	Emphasizes the personal nature of teacher-student interactions. Guides and directs students by asking questions, exploring options, suggesting alternatives, and encouraging them to develop criteria to make informed choices. Overall goal is to develop in students the capacity for independent action, initiative, and responsibility. Works with students on projects in a consultative fashion and tries to provide as much support and encouragement as possible.
Delegator	Concerned with developing students' capacity to function in an autonomous fashion. Students work independently on projects or as part of autonomous teams. The teacher is available at the request of students as a resource person.

Consistently, Campbell and Berge (2009) also stress that teaching styles are not fixed but influenced by the dynamic roles play in teaching-learning contexts that "students' styles come to match their teachers,' just as teachers' styles come to match the predominant style profile at their school and within their academic discipline" (p. 2070). The teacher-student dynamic relationships can be seen in the discussion of teacher-centered and student-centered styles. Kember (1997) breakdowns two broad categories of teaching: teacher-centered/content-oriented and student-centered/learning-oriented conceptions. The former is viewed as a traditional approach that focuses on content or knowledge, centering teacher in the classroom; the later focuses on students' learning with which students are not passive knowledge receiver but have "greater autonomy and control over choice of subject matter, learning methods and pace of study" (Gibbs, 1992, p. 23). Keep in mind that the two conceptions of the teaching styles are not in black or white but a tendency that have pros and cons of each. O'Neill and McMahon (2005) present a brief figure to illustrate the continuum of teacher-centered and student-

centered styles as below:

Figure 6 *Teacher-centered and student-centered learning continuum*

Teacher–centred Learning	Student–centred Learning
Low level of student choice	High level of student choice
Student passive	Student active
Power is primarily with teacher	Power primarily with the student
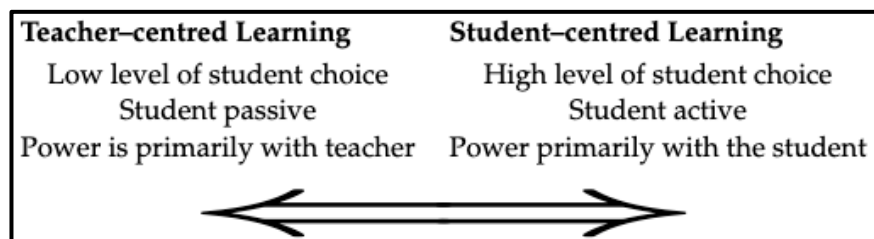
Note: resource: O'Neill and McMahon (2005, p. 29)

Relevant to teaching styles is classroom management, which includes both instructional and behavioral management (Egeberg, McConney, & Price, 2016), reflecting teachers' actions and attitudes toward teacher-student role to maintain classroom environment. As Baumrind (1971) identifies, classroom management styles are categorized into four dimensions based on the amount of control the teacher demonstrates and the degree of involvement of the students in the classroom, which are: authoritarian, permissive, indulgent and authoritative. Glickman and Tamashiro (1980) also conceptualize three classroom management approaches of managing student behavior: interventionist (high teacher control, low student control), interactionalist (equal teacher-student control), and non-interventionist (low teacher control, high student control). Note that teaching style and classroom management style of the teacher represent the teacher's belief about how teaching should be, and what is more effective.

In recent years, the debate on the two teaching styles has moved more towards a student-centered perspective. It has been suggested that with a use of technology, the

educational potential of technology can bring makes a shift from teacher-centered to student-centered approaches. Nevertheless, in classrooms, it is usually that teachers are the one who decide what, how, when students should learn, that is, whether teacher-centered or student-centered is depending on teachers' decisions. It may not be surprised that in Barrett, Bower, and Donovan's study (2007), they found "regardless of the changes in technology, teaching style has not changed and remains teacher-centered" (p. 46). How teachers integrate technology into their teaching may fit to their existing teaching styles, that is why teaching style locates at the highest level of Hampel and Stickler's (2005) skills pyramid as it suggests that the goal of teacher education in educational technology is to develop teacher's own personal teaching style emerging with technology usage as they have gained familiarity and confidence with technology use. Bringing educational technology into classroom may challenge teacher's authority, as it has been suggested to give more control to students with the use of technology. In this sense, understanding teaching styles and classroom management styles can assist to help be aware of the teacher's values, beliefs, and characteristics which reflect their teaching practices.

2.4.3 Teacher psychology

Every teacher comes into the classroom with their cognitive and behavioral perspectives in terms of that what to teach and how to teach. Since psychology help to describe, interpret, predict behaviors, looking at teachers' mind process can reflect into their teaching actions. Moreover, understanding what motivate teachers to change (or resist to change) their current teaching, and what emotions they have may gain insights into teacher engagement and professional development. It is well acknowledged that teachers' psychology affects significantly on their teaching practices and students' learning outcomes, as Dörnyei and Ushioda (2013) stress "if a teacher is motivated to

teach, there is a good chance that his or her students will be motivated to learn" (p. 158). For language learning, as Mercer et al. (2016) state "successful language learning depends to a large degree on teachers and, as such, for all concerned, we must make their professional well-being a priority" (p. 224). Nevertheless, the existing research tend to focus on students' psychology rather than teachers' (Dörnyei & Kubanyiova 2014; Mercer & Kostoulas, 2018; Stockwell & Reinders, 2019).

Previous studies looking at what internal factors affecting teacher's adoption of educational technology have found that the key factors are teachers' beliefs, attitude, motivation, and emotion. Regardless recognizing the potentials new methods can bring, some teachers stick with traditional methods and resist to change. Although teachers generally are optimistic about technology use for language teaching and learning, their individual thoughts about themselves, interpersonal thoughts about others (e.g., students, colleagues, parents), and contextual thoughts about environment (e.g., institution, society, culture) may shape/change their mental process in some ways that hinder actual usage of technology. Ertmer and Ottenbreit-Leftwich (2010) as well as Ertmer et al. (2012) stress that teachers' beliefs about how students learned, as well as the value they perceived of technology to the teaching/learning process affect how teachers integrate technology (see also Kim et al., 2013; Lai et al., 2016; Liu, 2011). As per Chen (2008) conducted a qualitative study to explore the inconsistency between teachers' pedagogical beliefs and their practices of technology integration. In the study, it was found that twelve high-school teachers teaching various subjects in Taiwan expressed their willingness to use technology initially; however, their practices with technology remained a teacher-centered and lecture-based way, or even, resisted to technology. It was found that the teachers' beliefs were not entirely based on their own intensions but the environment surrounding them, where "the school settings,

evaluation methods, and attitudes of other stakeholders such as students, parents, and administrators all confirmed and strengthened the belief" (p. 72). From this point of view, teachers' psychology is regarded as a dynamic system affected not only by teachers' personal knowledge and experiences but also contextual factors.

Furthermore, we can see how the sources of psychology come hand-in-hand that are difficult to separate one from the others. For instance, if we look into the questionnaire items based on Technology Acceptance Model (TAM), which is the most widely used framework to measure teacher's attitude toward education technology acceptance, we can easily find how "attitude," "belief," "emotion," "motivation," "identity" overlap in some ways, for instance: "*Interacting with computers does not require a lot of mental effort*," "*Computers make work more interesting*," "*I look forward to those aspects of my job that require me to use computers*" (Teo et al., 2008, p. 270) (see further discussion in **Chapter 2.6.1.1**). Also, the taxonomy of motivation in self-determination theory (SDT) defines intrinsic motivation as "doing something because it is inherently interesting or enjoyable" (Ryan & Deci, 2000, p. 55), again, we can see the interrelationship between motivation and emotion.

If teaching styles and classroom management styles are the outcomes of teacher's actions, teachers' beliefs can be seen as the influences, but where do their beliefs come from? Richards and Lockhart (1994, p. 31) suggest that the sources for teachers' beliefs are:

(1) their own experience as language learners;

(2) experience of what works best;

(3) established practice;

(4) personality factors;

(5) educationally based or research-based principles; and

(6) principles derived from an approach or method.

Identifying how these factors contribute to teachers' psychology may help predict individual change. Fives and Buehl (2012) emphasize the goal of research into teachers' beliefs is to "establish a clear psychological construct, beliefs, that could serve as an explanatory and predictive mechanism for explaining differences in teachers' practices, outcomes with students, and experiences" (p. 471). However, previous studies usually do not define *teachers' beliefs* carefully but see it as teaching styles or teaching strategies, thus, Fives and Buehl (2012) suggest research on *teachers' beliefs* should have a clear definition. Accordingly, they see teachers' beliefs as *filters* affecting perception and interpretating information and experience, as *frames* helping define a problem, and as guides motivating actions. Fives and Buehl (2012, p. 471) point out the complexity of teachers' beliefs which can cover the following aspects:

(1) self: teachers' sense of efficacy, identity, and role as a teacher

(2) context or environment: teachers' beliefs about their school climate or culture, as well as their perceived relationships with colleagues, administrators, and parents

(3) content or knowledge: regarding the different bodies of knowledge they teach to students or learn themselves

(4) specific teaching practices: specific teaching practices, which included beliefs about topics such as cooperative learning, teaching science, or the use of inquiry strategies

(5) teaching approach: beliefs about a holistic approach to teaching

(6) students: teachers' beliefs about students, including (but not limited to)

> beliefs about diversity, exceptionalities, language differences, ability, learning, and development

Furthermore, it is assumed that experienced teachers are relatively reluctant to change their existing beliefs about teaching and learning than novice teachers; however, "in-service teachers across the career trajectory are a vitally important population to understand in terms of their unique psychological situations and the specific challenge they face" (Mercer & Kostoulas, 2018, p. 6). Knowing what aspects of teachers' beliefs are relatively open to change and the factors make the change (or hinder the change) can help raise awareness of teacher development. However, the other issue of research in teachers' beliefs is the difficulty to assess as it can be implicit or explicit. In other words, research conducting through survey and interview see beliefs explicit that can be measured; however, it has been criticized that:

> Teachers will give the desired answer and may not differentiate across beliefs; teachers do not have the language to articulate what they believe, nor do they share the same language as the researchers; and teachers are not aware of what they believe. (Fives & Buehl, 2012, p. 474).

Thompson (1992) also emphasized that "the relationship between beliefs and practice is a dialectic, not a simple cause-and-effect relationship" (p. 140). In these regards, it can explain why thoughts and actions are not consistent in some research. With an assumption that teachers' psychology can be a combination of conscious and unconscious senses, researchers should be aware of the implicit and explicit research methods they use. In terms of teacher psychology, this study will look at teachers' implicit and explicit perceptions about themselves, about pedagogy, about technology,

about knowledge, about students and the context surrounding them to explore how teachers' attitude, emotion, motivation, identity, and beliefs affect their decision-making processes and teaching practice with educational technology integration.

2.4.4 Teacher knowledge, agency, and professional development

Teacher professional development is defined as "a process of continual intellectual, experiential, and attitudinal growth of teachers" (Lange, 1990, p. 250). Teachers have to continuously build their professional skills and knowledge throughout their careers, in turn, affect student learning. As many notions address the buzzwords like 'digital literacy,' 'digital competence,' 'technology skills for 21st century skills,' and 'web 2.0 skills' in their educational policies, knowledge about technology seems to become essential for teachers and students; though the slogans themselves are vague. In particular, due to the potential benefits that technologies can bring into language classrooms, Son (2018, p. 58) suggested that language teachers should "continue updating their CALL knowledge and skills" (see also Hampel & Stickler, 2005; Stockwell, 2009). Governments and educational institutions have spent large amounts of resources along with money and time to support teachers' professional development; nevertheless, teachers often view the opportunities irrelevant to their practices or do not meet their needs (see the report from Calvert, 2016). The tensions between education policies and teachers' perceptions are unlikely to promote teacher professional learning (Albion et al., 2015; Mausethagen & Granlund, 2012). Thus, the attention of how to give teachers agency over their work environment and professional learning has been increasing significantly recently. According to Calvert (2016), *teacher agency* refers to:

> The capacity of teachers to act purposefully and constructively to direct their
>
> professional growth and contribute to the growth of their colleagues. Rather

than responding passively to learning opportunities, teachers who have agency

are aware of their part in their professional growth and make learning choices

to achieve their goals. (p. 2).

In this regard, the concept of teacher agency highlights the responsibility for teachers themselves to take control over their professional development. However, teacher agency can be seen contrary to traditional teacher ideology, "for which teachers have been imposed or restricted by pre-determined curricula and prescriptive regimes of exam-oriented teaching" (Teng, 2019, p. 195). In Japan, the concept of agency in pedagogy is an innovative idea that does not have a directly translation but adopted a loan word ("エージェンシー") from English (Watanabe, 2019). Depending on the cross-cultural contexts, the interpretations of "agency" may vary (OECD, 2019). This in line with Priestley, Biesta, and Robinson's (2013) model of teacher agency (see **Figure 7**), illustrating the relationships between teacher agency and contextual factors: "agency is always enacted in a concrete situation, therefore both being constrained and supported by cultural, structural and material resources available to actors" (Priestley, Biesta, & Robinson, 2015, p, 4).

Figure 7 *A model of teacher agency*

Iterational

- Life histories
- Professional histories

Practical-evaluative

- Cultural
  - Ideas, values, beliefs, discourses, language
- Structural
  - Social structures (relationships, roles, power, trust)
- Material
  - Resources
  - Physical environment
-

Projective

- Short term
- Long term
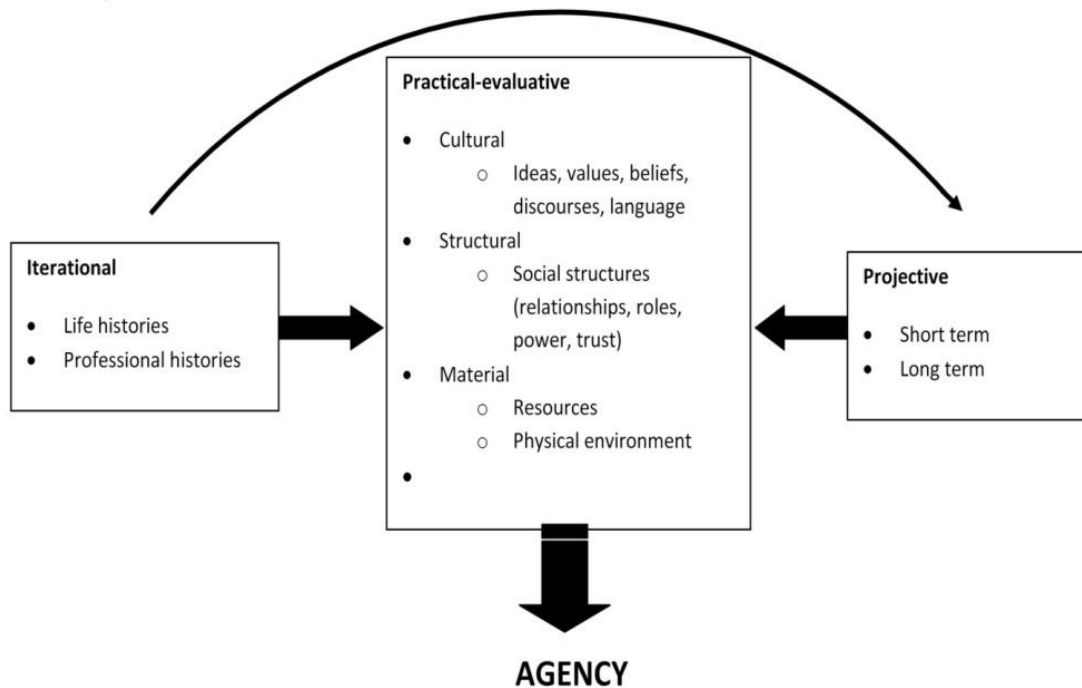
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Some researchers see teacher agency as an achievement from sociocultural (e.g., Albion et al., 2015; Lasky, 2005); while other see it from ecological perspectives in which human and environmental factors are associated, as they state:

> the achievement of agency will always result from the interplay of individual efforts, available resources and contextual and structural 'factors' as they come together in particular and, in a sense, always unique situations. (Biesta & Tedder, 2007, p. 137).

Teacher agency heavily related to teachers' personal capacity (skills and knowledge), beliefs (professional and personal) and values, which are rooting in their prior experiences (Priestley, Biesta & Robinson, 2015) and responding to the local context (Albion et al., 2015). These experiences from the past situation further make impacts on present and future (Biesta & Tedder, 2007; Priestley, Biesta, & Robinson, 2015), that is, the early influences may reform the current practices and further direct the plan for

future. From this point of view, we can see how teachers perceive their agency to take control over their teaching and decision-making with the use of technology in the classroom practices, in which teachers' agency of teaching is constrained by institutional policies. Therefore, for educational institutions, it is crucial to respect agency and provide an environment for teachers to have autonomy, choice, and voice they are able to reflect upon their actions. On the other hand, if teacher value agency, it is more likely they empower learners' agency which is believed "when students are agents in their learning, they are more likely to have 'learned how to learn' – an invaluable skill that they can use throughout their lives" (OECD, 2019, p. 2).

In this sense, it is crucial to know how teachers perceive their agency, of which "the individual who has a social history, a present social location, an understanding of the potentials of the resources for communication, and who acts transformationally on the resources environment and, thereby, on self are requirements of communication" (Kress, 2005, p. 20). Since abundant online resources are available and various technology-mediated communication tools may support teacher community, teachers are able to have more opportunities to exercise agency within technology-enhanced environment. Thus, understanding teachers' perception of agency within technology-enhanced environment and what factors facilitate or hinder their professional learning may shed lights into policies making that help teachers achieve their professional goals (White, 2018).

2.5 Student perceptions of educational technology

2.5.1 Learner resistance

No matter in traditional classrooms or technology-enhanced learning environments,

learners usually follow what teacher ask them to do, that is, they may not have "rights" to resist technology use if their teacher request. However, there still remain some barriers that hinder their learning with technology. For example, a lack of access, inadequate training (Stockwell & Hubbard, 2013), time and money (Doshmanziari & Mostafavi, 2017) rank highly as the difficulties teachers face mentioned in the previous section. Again, these barriers are relatively easy to solve and observe with both teacher and institutional supports. When these physical conditions are satisfied, is it a guarantee that students will embrace technology? Clearly no. More psychological barriers are involved that need to be explored (Stockwell, 2008).

Learners' reactions to educational technology may differ from formal and informal learning, in the way the former is more structured, instructor-led, and goal-oriented, which is more often conducted in traditional classroom settings. But, again, formal/informal and in-class/out-of-class learning are merely a general distinction, it should be kept in mind that how, where, when, and what technology is used, and teachers are responsible to create and maintain the learning environment where learners can become autonomous (Little, 2003). Following the trend that using technology for outside of classroom learning activities and self-regulated learning, it requires greater learning autonomy to achieve learning goals. Even though students generally view educational technology for language learning 'valuable,' 'useful,' 'interesting' in previous studies (e.g., Park, 2009; Lai & Gu, 2011), their intensions to use the certain CALL materials did not correspond with their actual use (e.g., Stockwell, 2010; Wang, 2020).

In Renaud's (2019) study, he conducted the surveys to examine EFL teachers' and students' perceptions of using an online learning application with the features of social

networking and learning materials sharing for blended learning in a Japanese university. It was found that although the students hold generally positive attitudes toward the online learning space, they were reluctant to send message to their teachers in English because of the anxiety of using the targeted language. The study also showed the students' preference of engaging learning activities with paper-based materials, as the teacher responded: "I can't really say whether it helped students or not. They do sometimes express a preference for paper or ask me to print things out for them" (p. 18). Students' lack of self-efficacy that hinder effective use of educational technology can be found in Chateau and Zumbihl's (2012) study. Similarly, the master students of EFL in France rated high scores in terms of 'usefulness' to the LMS; however, they were reluctant to take their new roles of taking control over their learning but preferred traditional language learning methods. The students recognized their autonomy had been slightly facilitated by the LMS and found teacher's role had been transferred to a tutor or counselor rather than a language expert. Nevertheless, the students expressed their anxiety of being watched over by the teacher, who is perceived as a controller in this sense, at the same time, the students revealed their preference of traditional teaching methods as they relied heavily on teacher's presence: "It is not a real course, I prefer to listen to a teacher"; "I need to be supervised; I have problems working on my own"; "I get stressed when I have difficulties; a traditional course is more serious" (p. 173). As such, although technology is perceived to facilitate language learner's autonomy, the previous studies have found that students were reluctant to take their new roles in technology-enhanced learning environment.

The current literature on students' perceptions of technology for language learning fail to balance leaners' (or users') attitudes toward technology and SLA. For instance, some studies tend to put the emphasis on technology that look at environmental constrains,

technology affordances and digital skills but stress less emphasis on language learning itself. Examining learners' "perceptions of technology for language learning" may be more complicated than "perceptions of technology" or "perceptions of language learning" but exploring what hinder leaners' resistance to technology can help teachers provide a better learning environment for learners.

2.5.2 Language learning styles and learning strategies

With an assumption that the wide range of technology-based alternatives enrich language learning context in which leaners are provided with more choices that fit their learning styles and strategies, individual differences in language learning may influence their adoption and adaption of technology use (e.g., Finch & Rahim, 2011; Hsu, 2016). In terms of individual differences (ID), the issue of learning styles and learning strategies have attracted considerable attention in literature. In the field of SLA and educational psychology, the terminology *learning styles* has not reached an agreed definition, but the notion reflects personal preferences and individual differences. According to Oxford's (2003) definition, *learning style* refers to "the general approach preferred by the student when learning a subject, acquiring a language, or dealing with a difficult problem" (p. 273).

Within the variety of learning styles models, the most well accepted models are VAK (visual, auditory, and kinesthetic styles) and Kolb's (1984, 1999) diverging, assimilating, converging, and accommodating learning styles. Dörnyei (2005) stresses that the concept of learning styles "represents a profile of the individual's approach to learning, a blueprint of the habitual or preferred way the individual perceives, interacts with, and responds to the learning environment" (p. 121). From this point of view, it is acknowledged that learning styles are associated with learners' individual preference

that "something we find more comfortable but can do another way if circumstances require it" (Ehrman, 1996, p. 54), which are grounded in an individual's personality.

It is believed that "students learn best when instruction and learning context match their learning style" (Dunn & Dunn, 1987, p. 55, as cited in Lilienfeld et al., 2011) so teachers are suggested assessing and respecting students' learning styles and adjust teaching processes to match students' preferences (see also Gardner's (2006) Multiple Intelligences Theory). However, leaners' learning styles do not always match with teacher's teaching style, nor with syllabus, language task, even nor with learners' individual beliefs about learning, abilities, and learning strategies (Dörnyei, 2005). In contrast to the advocates stating decreasing these learning styles "mismatches" can facilitate effective learning, the criticisms question the scientific evidence to support the effectiveness of "matching" leaning styles, claiming the lack of reliable and valid ways of assessment leads the beliefs of "students learn best when teaching styles are matched to their learning styles" a myth (see Lilienfeld et al., 2011).

While the notion of learning style remains controversial, it is important to consider the individuals' learning preferences when deciding whether to adopt technology for learning, that is, understanding how learners perceive their learning preferences and how teachers perceive learner's learning process may help exploring their integration of technology use based on their preferred learning styles (Ally, 2004; Brett, 1996; Choi et al., 2008; Wiebe & Kabata, 2010; Davies, 2019). For instance, if a student believes he/she learn better with pictures and texts (visual learning student), it is likely that he/she will prefer learning with PowerPoint and blog. And teacher may regard the students as auditory learning students benefit from CD-ROM or videoconferencing. Thus, when teachers and stakeholders design and plan to adopt educational technology,

they should "acknowledge and plan for accommodating language learner differences. As with other types of technology implementations, mobile learning should take into account a range of learning styles" (Stockwell & Hubbard, 2013, p. 9).

Another concept is *learning strategies*, which is often confused with *learning styles*. Unlike *learning styles*, which are more stable and unconsciously use, *learning strategies* are "thoughts and actions, consciously selected by learners" (Cohen, 2014, p. 110) that can be taught and trained. Oxford (1999) defines language learning strategies (LLS) as:

> Specific actions, behaviors, steps, or techniques that students use to improve their own progress in developing skills in a second or foreign language. These strategies can facilitate the internalization, storage, retrieval, or use of the new language. (p. 518)

In her more recent work, Oxford (2017) further provides a more specific definition:

> LLS are mental actions that are sometimes also manifested in observable behaviors. They are complex, dynamic, teachable, and at least partially conscious. LLS can be orchestrated to meet immediate learning needs in specific contexts. LLS can involve various self-regulation functions (e.g., cognitive, emotional/affective, motivational, social, and metastrategic) to (a) accomplish current language tasks, (b) improve language learning and performance, and/or (c) enhance long-term proficiency.

It can be found that how situational and social factors are added on individual

differences in the latest definition. As Oxford (2003) states, learning strategies cannot be judged as either good or bad, but are depending on the conditions that "make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations" (Oxford, 1990, p. 8).

Regarding language learning strategies, O'Malley et al. (1990) categorizes three types of LLS: cognitive strategies, metacognitive strategies, and social/affective strategies, in the similar vein, Oxford (1990) proposes six components: cognitive, mnemonic, metacognitive, compensatory, affective, and social strategies. The two classifications have received different criticism from different perspectives, overall, the essential components including the four strategies (see **Table 7**).

Table 7 *Four main components of LLS (adapted from Dörnyei, 2005, p. 169)*

LLS	Description
Cognitive strategies	Involving the manipulation or transformation of the learning materials/input (e.g., repetition, summarizing, using images).
Metacognitive strategies	Involving higher-order strategies aimed at analyzing, monitoring, evaluating, planning, and organizing one's own learning process.
Social strategies	Involving interpersonal behaviors aimed at increasing the amount of L2 communication and practice the learner undertakes (e.g., initiating interaction with native speakers, cooperating with peers).
Affective strategies	Involving taking control of the emotional (affective) conditions and experiences that shape one's subjective involvement in learning.

From practical teaching practices to research, we can easily find that technologies are widely used to support learners developing strategies for different language skills (i.e., listening, reading, speaking, writing) and related aspects (i.e., vocabulary, grammar,

pronunciation). For instance, Yoon and Jo (2014) conducted a study to explore how the four university EFL students in Korea utilized their learning strategies to enhance writing skills with the use of a corpus-based system. Accordingly, it was found that the students have used metacognitive strategies for self-evaluation/monitoring, cognitive strategies making use of materials, association, grouping, translation, and note-taking, affective strategies for lowering anxiety and self-encouragement, as well as social strategies questioning for clarification. Among the four categories of LLS, cognitive strategies were found to be the most frequently used compared with the others. Addition to this, Yoon and Jo (2014) also pointed out that high proficient learners are more aware of their learning process and strategy use (see also Chen et al., 2020). If learners are more aware of the strategies they use, they may use them more effective/flexible to achieve their learning goals, thus, researchers have emphasized emphasize the importance of strategy training with the use of technology (Hubbard & Romeo, 2012; Levy & Stockwell, 2006; Stockwell & Reinders, 2019).

2.5.3 Learners' psychology

Learners come from different backgrounds and learn a language for various reasons and goals that make differences in the ways of learning process and language achievement. In respect of individual differences, many researchers in SLA have been trying to explore leaner's psychology from two directions: "to understand the general principles of the human mind and to explore the uniqueness of the individual mind" (Dörnyei, 2005, p. 1). One of the hottest topics is *motivation*, which "provides the primary impetus to initiate L2 learning process; indeed, all the other factors involved in SLA presuppose motivation to some extent" (Dörnyei, 2005, p. 65). The distinction between integrative and instrumental motivation has been dominated in motivational research for a long time (Gardner & Lambert 1972; Gardner 1985). Accordingly, learners with an

integrative motivation learn the L2 in order to take part in the community using the language, which reflects "whether the student identifies with the target culture and people in some sense, or rejects them" (Cook, 2008 p. 137). On the other hand, learners have instrumental motivation learn the L2 for practical reasons (e.g., graduation requirement, to get a job), indicating that the learners learn the language "for an ulterior motive unrelated to its use by native speakers" (Cook, 2008, p. 138). According to the sources of motivation, it can be further categorized as intrinsic motivation and extrinsic motivation. Intrinsic motivation refers to doing an activity for interest, enjoyment, satisfaction, which is highly autonomous and with self-determination. On the contrary, extrinsic motivation refers to taking part in a particular activity for the sake of receiving extrinsic rewards or avoiding punishment, and the behaviors are least autonomous. Also, there is also a state called amotivation (AM), which means "the lack of any kind of motivation, whether intrinsic or extrinsic (Dörnyei & Ushioda, 2013, p. 23)."

However, the view that learners' integrative/instrumental and intrinsic/extrinsic motivation are static has faced some criticism. Dörnyei and Ushioda (2013) found a dynamic relation among the types of motivation, for example, "students will lose their natural intrinsic interest in an activity if they have to do it to meet some extrinsic requirement." Researchers have been trying to find the factors affecting learners' motivation of learning L2, as Schmidt et al. (1996) conducted a survey study applied cognitive and educational psychology and found the basic dimensions to motivation for learning foreign languages are affect, goal orientation, and expectancy. Furthermore, according to their comparative factor analysis of Dörnyei's (1990) and Julkunen's (1989) studies, the factors contributing to motivation are identified (see **Table 8**). Although the questionnaires in the three studies are different, we can see that the factors can be not only personal but also interpersonal, because one's motivation can be affected by the

others and the environment surrounded him/her. Moreover, motivation is complicated that associated with more psychological influences which are dynamic and change according to complex factors.

Table 8 *Factors affecting motivation for L2 learning (adapted from Schmidt et al., 1996, pp. 52-53)*

	Schmidt et al. (1996)	Dörnyei (1990)	Julkunen (1989)
Factor 1	Determination	Instrumentality	Communicative orientation
Factor 2	Anxiety	Need for achievement	Intrinsic orientation
Factor 3	Instrumental orientation	Interest in foreign cultures	Attitudes toward teacher/method
Factor 4	Sociability	Values associated with language	Integrative motivation
Factor 5	Attitudes of foreign culture	Bed learning experiences	Helplessness
Factor 6	Foreign residence	Spend time abroad	Anxiety
Factor 7	Intrinsic motivation	Language learning as challenge	Criteria for success
Factor 8	Beliefs about failure		Latent interest in English
Factor 9	Enjoyment		

In many studies, technology has been treated as a "motivator" to enhance learners' learning and teachers often believe their students enjoy learning with technology. But if we see motivation as "long-term stable attitudes" (Cook, 2008, p. 137), the "motivation" that technology can bring may be limited, as students may see it interesting simply because it is novel. Researchers have reported that technology help reduce learners' anxiety, enhance confidence, increase learning interest, improve attitudes toward learning (see Golonka et al., 2014, for the review). However, the cause-effect relationships between technology and the "internal effectiveness" seem to be a

fallacy, for example, as Stockwell and Reinders (2019) criticize that "technology is often believed to be inherently motivating for students and linked to the development of autonomy." In other words, students who are seen to be autonomic to use an application to learn vocabulary, it is not necessary because of the application itself but the leaners are already motivated to learn the language (or simply the task is interesting). It seems that the research to date usually measure learner psychology of using technology for L2 learning in two directions: either focusing on SLA or technology, but with a lack of integration. For instance, studies around attitudes toward language learning with technology tend to measure learners' attitudes toward the technology use (e.g., usefulness, ease of use) rather than attitude toward language learning. Thus, this study will view learner's psychology as a dynamic system that explores how psychological factors involve in students' perceptions of using technology for Chinese language learning purpose from broader perspectives.

2.5.4 Learner autonomy and self-regulated learning with technology

Life-long learning is the goal of education, especially in second language education that learners are trying to achieve "native-like" language proficiency. To enhance learners' out-of-class learning, or even continuous learning that after graduation or in the workplace, autonomy and self-regulated learning have been receiving growing attention in the field of SLA (Benson & Voller, 2014). However, autonomy seems to be a buzzword that has various definitions (Little, 1991; Dickinson & Wenden, 1995). The most well-known definition of autonomy is "the ability to take charge of one's learning," which is proposed by the father of autonomy (Holec, 1981, p. 3). More recently, Benson (2013) broadly defines in similar terms: "the capacity to take control of one's own learning" (p. 2). According to Holec (1981), autonomous learners are expected to have "the responsibility for all the decisions concerning all aspects of this learning" (p.3),

including:

    1. determining the objectives

    2. defining the contents and progressions

    3. electing methods and techniques to be used

    4. monitoring the procedure of acquisition properly speaking (rhythm, time, place, etc.)

    5. evaluating what has been acquired

The two definitions above emphasize the mental ability of autonomy, rather than behavior, as Holec (1981) states:

> It is indeed an ability, ''a power or capacity to do something'' and not a type of conduct, ''behaviour'.' 'Autonomy' is thus a term describing a potential capacity to act in a given situation - in our case, learning - and not the actual behaviour of an individual in that situation. (p. 3)

By contrast, the notion of self-regulation can be seen as a set of behaviours (Lewis & Vialleton, 2011). According to the lastly modified Zimmerman's (2013) model, self-regulation learning includes three phases: forethought, performance, and self-reflection (see From these points of view, technology has been seen as a promise to enhance autonomous learning and self-regulated learning since technology enrich the learning context where leaners are able to access numerous learning resources outside of the classroom anytime and anywhere (Lai, 2017; Reinders & White, 2016; Ushioda, 2011). For example, Tsai (2019) conducted an experimental study to see how EFL learners in Taiwan developed their learning autonomy with online learning materials in a technology

enhanced EFL learning environment. She provided out-of-class activities (e.g., watching teacher-made video clips, online resources, taking online quizzes and submitting e-journals) through Moodle and found that the students had been enhanced regarding they had become independent and self-directed in learning and could pave their learning with the use of the online materials. Similarly, Lai and Gu (2011) conduct an online survey and interview with university students learning foreign languages in Hong Kong, they found that most of the students were able to self-regulate their learning with the use of technology outside the classroom, and in particular, they preferred engaging in social activities (e.g., Facebook, MSN). However, Lai and Gu (2011) note that the students' digital literacy and learning strategies affect significantly on their usage. This highlights the importance of learner training in the effective use of technology for language learning purposes (Hubbard, 2004; Hubbard & Romeo, 2012).

Alhough technology offers opportunities, or say, freedom (Hamilton, 2013) for learners to manage their learning and provides a wide range of resources for learners to select the contents/methods that meet their needs, there is no guarantee that autonomous learners are able to utilize technology automatically (Lai, 2017). As Reinders and Hubbard (2013, p. 360) state: "overly confident predictions were common about the demise of the language teacher and the empowerment of learners to the point where they would be able to control every aspect of their learning." To facilitate language learners' autonomy and self-regulating learning inside/outside of classroom, or even formal/informal learning in a technology-enhanced learning environment, the role of learner, teacher, and technology should be redefined (Stockwell, 2015).

Figure 8) with various strategies (e.g., self-evaluation, goal setting, and planning, seeking information). It seems autonomy and self-regulated learning have some common elements; however, Murray (2014) identifies social dimensions of autonomy and self-regulation that designed in pedagogical environment including emotional, spatial and political dimensions, where the learners learn within social interactions with others.

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Figure 8 *Zimmerman's model: Phases and subprocesses of self-regulation (Zimmerman, 2013, p.142)*

Performance Phase

Self-Control
Self-instruction
Imagery
Attention focusing
Task strategies
Environmental structuring
Help seeking

Self-Observation
Metacognitive monitoring
Self-recording

Forethought Phase

Task Analysis
Goal setting
Strategic planning

Self-Motivation Beliefs/Values
Self-efficacy
Outcome expectancies
Task interest/values
Goal orientation

Self-Reflection Phase

Self-Judgment
Self-evaluation
Causal attribution

Self-Reaction
Self-satisfaction/affect
Adaptive/defensive

2.6 Difficulties in applying theory in CALL adoption and implementation

With a specific focus on the effects of CALL adoptions, the literature continues to measure various aspects of the factors. It has been discussed the affordances and barriers of technology itself, but recently, it shifts to see how human interact with technology. For example, looking at the interaction between behaviors and perceptions as they have an impact on adoption and usage. Moreover, regarding research methods, the trend in CALL has recently shifted from measuring quantitative data to psychological aspects of qualitative data (Chapelle, 2009; Levy et al., 2015; Stickler &

Hampel, 2015). There has been criticism of the CALL field that researchers tend to borrow theory from second-language acquisition (SLA) and technological theories without combining them (Beatty, 2010; Chapelle, 2009; Hubbard & Levy, 2016). Critics have claimed that studies on attitudes conducted solely through interviews or surveys lack in-depth insights as attitudes change over time (Dörnyei & Ushioda, 2013) and not many studies have undertaken a longitudinal study of classroom practice. The following theories are widely used in literature from the dimensions of technology, SLA, and psychology.

2.6.1 Theories of technology

As technology plays a significant role in human lives, research into analyzing the relationship between human and technology has become a crucial issue. Researchers have built various theories and models of technology to predict intention to adopt innovate technology. It should be pointed out that several of the theories used in CALL did not originate from CALL and do not directly relate to language teaching and learning, and many have been adopted from other fields. The following theories are examples of these:: (1) Technology Acceptance Model (TAM), (2) Diffusion of Innovations Theory (DIT), and (3) Hype Cycle.

2.6.1.1 Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT)

Proposed by Davis (1989), TAM attempts to predict the reasons for users' acceptance or rejection of technology and suggests that users' attitudes toward technology are affected by two beliefs: perceived usefulness (PU) and perceived ease of use (PEOU). The two components are assumed to shape attitude toward use, which may further affect behavior intention of use. Building on TAM, Venkatesh et al. (2003) integrate seven

more theories and develop Unified Theory of Acceptance and Use of Technology (UTAUT), which extensively includes more factors: performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). In addition to the four main factors, UTAUT also includes four moderating individual characteristics: gender, age, experience, and voluntariness of use, suggesting these factors and variables will affect behavioural intention (BI) and usage behaviour (UB).

While the self-reported methods might help understand users' attitude and measure users' determination of technology use, TAM and UTAUT have been criticized for "being overly simplistic and for taking a narrow perspective, which focuses only on individual adopters' beliefs, perceptions and usage intention" (Shachak et al, 2019, p.1). The over-simplicity makes TAM and UTAUT an easy "tool" to assess users' attitudes. Shachak et al. (2019) regard TAM as a "quick and dirty" measurement and note the overuse of the theories in studies results in a lack of contribution to knowledge. Moreover, the largest criticism has been the lack of evidence linking attitude and actual use (Turner et al., 2010). That is, the theories are unable to explain the gap between intention and actual technology usage, more important, they cannot guarantee positive attitudes may lead to adoption and implementation (see Wang, 2020).

2.6.1.2 Diffusion of Innovations Theory (DIT)

Diffusion of Innovation Theory is developed by Roger in 1960s that highlights the process of adopting/rejecting innovations (e.g., new ideas, new products, new methods). In the fourth edition of his book: *Diffusion of Innovations*, Rogers (2003) defines diffusion as "the process in which an innovation is communicated thorough certain channels over time among the members of a social system" (p. 5). The theory is widely used to explain how a new technology spreads over time from a social system and is

relevant to different field of studies such as marketing, health, and science. The key elements of the DIT are innovation, communication channels, time, and social system that influence how, why, when, where new technology spread. Roger (2003) suggests five stages when individuals are adopting innovation: (see **Table 9**).

Table 9 *Rogers' (2003) five-stages process of adoption*

Stage	Description
1. Knowledge	Individual first receives information about an innovation but has limited knowledge about it.
2. Persuasion	Individual shapes positive/negative attitude toward the innovation and starts to find more information if he/she is interested.
3. Decision	Individual chooses to adopt or reject the innovation according to the advantage/disadvantage he/she perceive.
4. Implementation	Individual applies the innovation and observes if it is useful. (Noted that uncertainty about the innovation occurs in this stage, thus, technical support from others are necessary.)
5. Conformation	Individual has decided to put into practice and sustain the usage. However, he/she may seek for confirmation of the decision. (Noted that it may cause *cognitive dissonance*. Since the individual has already implemented the innovation, it is hard to admit the decision he/she made was wrong.)

Based on different characteristics, Roger classifies five types of adopter (see **Table 10**), suggesting that the first individuals adopt a new innovation are *innovators* (2.5%), followed by *early adopters* (13.5%) and *early majority* (34%). Later on, *late majority* (34%), and *laggards* (16%), who adopt eventually. The further descriptions of each adopter can be found in the following table.

Table 10 *Adopter categories*

Adopter category	Definition
Innovators	Innovators are the first individuals to adopt a new technology. Innovators are willing to take risks, are the youngest in age, have the highest social class, have great financial liquidity, are very social, and have the closest contact with scientific sources and interaction with other innovators. Risk tolerance has them adopting technologies that may ultimately fail. Financial resources help absorb these failures.
Early adopters	The early adopters are those who adopt innovation after a technology has been introduced and proven. These individuals have the highest degree of opinion leadership among the other adopter categories, which means that they can influence the opinions of the largest majority. They are typically younger in age, have higher social status, more financial liquidity, more advanced education, and are more socially aware than later adopters. These people are more discrete in adoption choices than innovators and realize judicious choice of adoption will help them maintain a central communication position.
Early majority	Individuals in this category adopt an innovation after a varying degree of time. This time of adoption is significantly longer than the innovators and early adopters. This group tends to be slower in the adoption process, has above average social status, has contact with early adopters, and seldom holds positions of opinion leadership in a system.
Late majority	The late majority will adopt an innovation after the average member of the society. These individuals approach an innovation with a high degree of skepticism, have below average social status, very little financial liquidity, are in contact with others in the late majority and the early majority, and show very little opinion leadership.
Laggards	Individuals in this category are the last to adopt an innovation. Unlike those in the previous categories, individuals in this category show no opinion leadership. These individuals typically have an aversion to change-agents and tend to be advanced in age. Laggards typically tend to be focused on "traditions," are likely to have the lowest social status and the lowest financial liquidity, be oldest of all other adopters, and be in contact with only family and close friends.

Note. Adapted from (Rogers, 2003, pp. 263-266).

According to Rogers (2003), he suggests that only a few individuals are innovator, with 2.5% of the population. The model also shows that the rate of adoption measured by the length of time starts slowly with a little of innovator but greatly increases and reaches "critical mass." In other words, after a new innovation is introduced into the social system, it may be gradually accepted according to innovation attributions that affects an individual's decision. The attributions of innovation include relative advantage (perceived efficiencies better than current technology), compatibility (perceived relevance to existing value and experience), complexity (perceived difficulties to learn and to use), observability (visible and widespread effectiveness), and trialability of a technology (testability to decrease risk and cost). It is suggested that the diffusion among the social group relies on early innovators a lot, as they are ranked in the highest social class who may make a great influence on persuading and spreading. Overall, the model sheds lights into the process that people make decisions on technology adoption from micro (individual) to meso (society) and macro (market) levels, and characterizes various adopters, moreover, highlights the crucial role that society and market plays into innovative technology adoption and diffusion. However, as Roger has noted that non-adopter and incomplete adopter are not included in the classification, DIT provides little insight into non-adoption of new technology (see MacVaugh & Schiavone, 2010). Further, the five processes fail to explain discontinuance, for instance, one may adopt a new technology but later becomes non-user. Again, a similar criticism to TAM has been addressed, as Lyytinen and Damsgaard (2001) have argued, DOT is "quick to apply" but few studies have cautiously analyzed and explained the complexity of the diffusion from multiple perspectives.

Figure 9 *Five stages of diffusion of innovations*
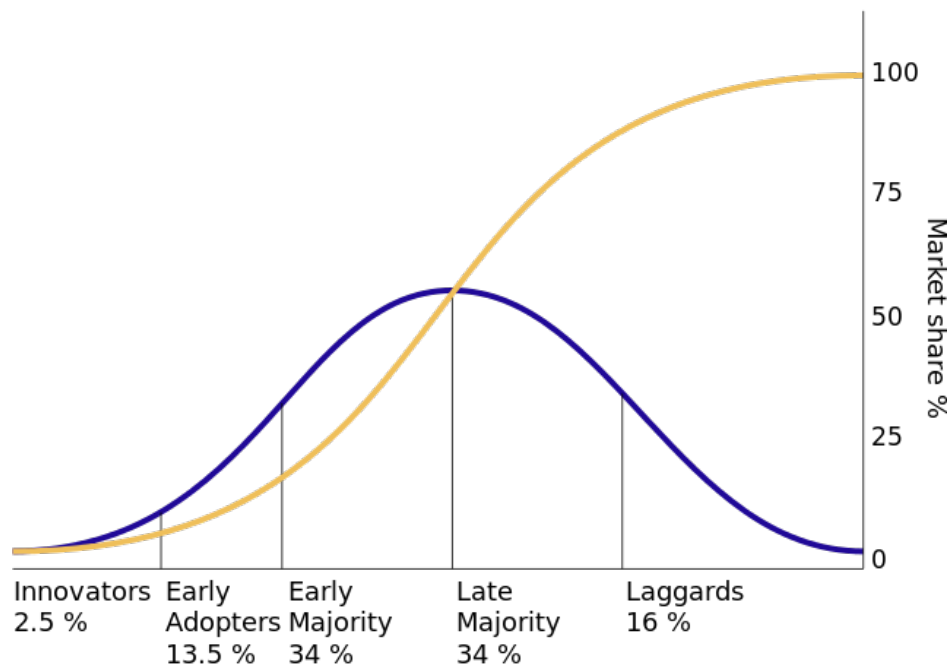
Note. Source: https://en.m.wikipedia.org/wiki/File:Diffusion_of_ideas.svg

2.6.1.3 Hype Cycle

Gartner, which is a research and advisory firm specializing in providing information and advice about information technology, introduced Hype Cycle in 1995. The Hype Cycle (see **Figure 10**) is a graphical depiction used to present the life cycle stage of emerging technologies go through five phases. It is suggested that different technologies move with different speed in a market, which is regarded useful to track the growth of technologies and predict future potential. The five phases in the Hype Cycle are: *Technology Trigger*, *Peak of Inflated Expectations*, *Trough of Disillusionment*, *Slope of Enlightenment* and *Plateau of Productivity*. The descriptions of each phase can be found in **Table 11.**

Figure 10 *Gartner Hype Cycle*
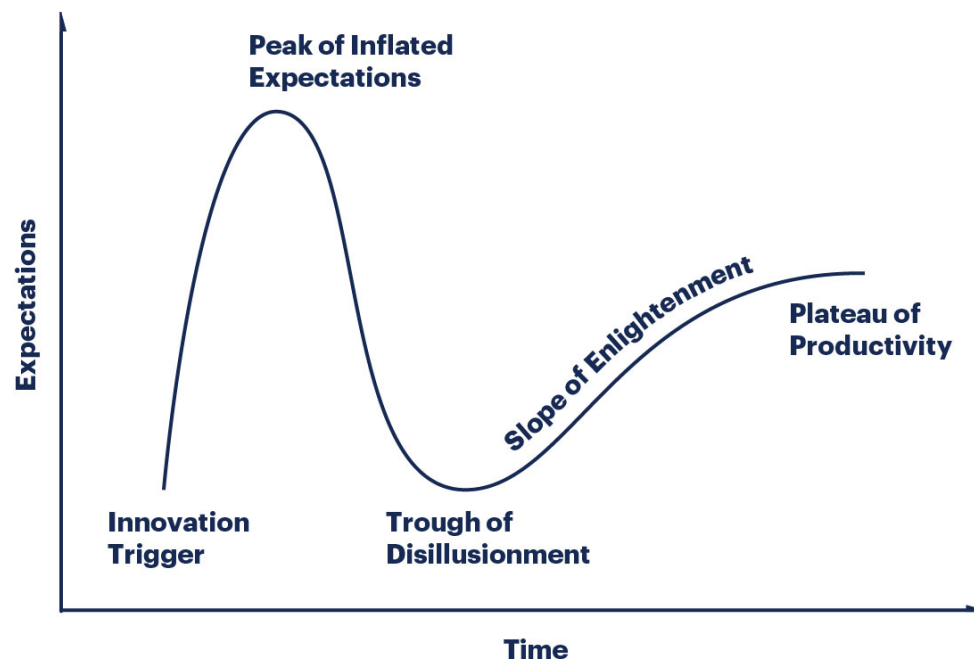
Note. Source: Gartner. Retrieved from

https://www.gartner.com/en/research/methodologies/gartner-hype-cycle

Table 11 *Gartner's five phases of a technology's life cycle*

Phase	Description
1. Innovation Trigger	A potential technology breakthrough kicks things off. Early proof-of-concept stories and media interest trigger significant publicity. Often no usable products exist and commercial viability is unproven.
2. Peak of Inflated Expectations	Early publicity produces a number of success stories — often accompanied by scores of failures. Some companies take action; many do not.
3. Trough of Disillusionment	Interest wanes as experiments and implementations fail to deliver. Producers of the technology shake out or fail. Investments continue only if the surviving providers improve their products to the satisfaction of early adopters.
4. Slope of Enlightenment	More instances of how the technology can benefit the enterprise start to crystallize and become more widely understood. Second- and third-generation products appear from technology providers. More enterprises fund pilots; conservative companies remain cautious.

5. Plateau of Productivity	Mainstream adoption starts to take off. Criteria for assessing provider viability are more clearly defined. The technology's broad market applicability and relevance are clearly paying off.

Note. Source: Gartner (2020). Retrieved from https://www.gartner.com/en/research/methodologies/gartner-hype-cycle

The Hype Cycle has been applied to measure CALL adoption in a few studies, however, Kennedy and Levy (2009) note the "differences in the goals and context between business and education" (p. 446). Although it has also been criticized as a lack of evidence in natural settings and without data that can justify the cycle (O'Leary, 2008), Kennedy and Levy (2009) suggest two implications that we can learn from Garter's hype cycle, which are:

> the unwillingness of teachers to engage with a technology because no sooner will they have acquired the necessary skills and expertise than the technology will be replaced; and the challenge for educational administrators who fear the costs of continually upgrading hardware and software when the benefits appear to be transitory. (p. 446)

In this sense, it is crucial to understand how a new/old technology may be adopted in an educational context. Realizing the gap between expectations and reality may help "save" the technology for living longer, or to say, to help improving the technology for sustainable use, especially for the technologies which are regarded as mature (e.g., Moodle).

To sum up, the theories of technology mentioned above might help explore users' (teachers and students) attitude toward technology (TAM), characterize users' type and

identify the processes of adopting technology (DIT), also, know the stages of a technology (Hype Cycle). However, due to the criticisms the theories have received, it is urgent for CALL studies to fill the gap between the theories and reality, thus, grounding on evidence in educational contexts are necessary.

2.6.2 Sociocultural Theory

Although Vygotsky's sociocultural theory is not originally devised for language teaching and learning, it has received an increasing amount of attention over the past in second language acquisition teaching and research. Sociocultural theory views individual learning as a social process with the interaction with other people. Sociocultural theory emphasizes not only the impacts peer, parents, adults (perceived more knowledgeable people) make on learning, but also cultural affects, which is different from Piaget's theory that believes cognitive development is universal across cultures. That is to say, sociocultural theory suggests that the ways in which social interactions can gradually change people's behaviour and beliefs vary from culture to culture. In SLA research, it is used as a rationale that scaffolding, may help learners to move through the zone of proximal development (ZPD) (see Bruner, 1983). According to Vygotsky (1978), the metaphor of ZPD is defined as:

> the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers. (p. 86)

From this point of view, it is widely acknowledged that cognitive development cannot be separated from cultural and social contexts. Warschauer (2005) suggests applying

sociocultural theory into CALL research to understand the relationship of human and technology, as "it mediates and transforms human activity" (p. 11). He advocates that we should be aware of users' origins, histories, and developmental process from sociocultural perspectives:

> [W]e can only understand CALL when we place it in its broader historical, social, and cultural contexts. For example, we cannot understand the types of motivation and attitudes that students have toward working with technology unless we understand the importance of new technologies in today's economy and society. (p. 3)

Along these lines, Meskill (2013) regards online education as complex human interactions, suggests looking into linguistic, social, cultural, historical aspects from sociocultural perspectives to observe and describe "relationships between individuals and the social structures in which and with which they interact" (p. 10). Therefore, as sociocultural theory has suggested, the nature of learning/teaching with technology are shaped by teacher-student interactions, institutional contexts, and more broadly, the cultural, social, historical contexts. For the current study, this theory is relevant in that it has an impact on the ways in which teachers and learners interact with one another, and this may have a direct impact on the perceptions that they have regarding using technology in their educational contexts.

2.6.3 Theories of psychology

2.6.3.1 Expectancy-Value Theory (EVT)

There are multiple psychological theories of motivation that can also be thought to help explain the attitudes and perceptions that may be held regarding technology. One of the

most well-known theories of motivation, Expectancy-Value Theory (EVT), was developed by Eccles and her colleagues (see Eccles et al., 1983; Wigfield & Eccles, 2000), proposing that achievements are motivated by a combination of two main factors: *expectancies for success* and *subjective task values*. The former means to what extent an individual's beliefs about the ability and effort may achieve a particular goal; the later relates to an individual's beliefs about perceived outcomes. Accordingly, the components of task value are: (1) attainment value (importance), (2) intrinsic value (enjoyment), (3) utility value (perceived usefulness), and (4) cost (required effort, lost alternative opportunities, and negative affects). We can see how they incorporate from a simple formula:

Motivation = Expectancy x Value

That is, if an individual has high expectancy and perceives high value to do a task, it is likely to increase his/her motivation and vice versa. Motivation may decrease when one of the factors decreases. Eccles and Wigfield (2000) use expectancy-value model to evaluate children's learning outcomes and suggest that the other factors may affect *expectations for success* and *task value*, for instance, individuals' differences (e.g., aptitudes, abilities, past experiences, short-term and long-term goals, personal and social identities, affective reactions) and environmental influences (e.g., cultural milieu, socializers' beliefs, behaviors). Similar to EVT is Self-Efficacy Theory which is defined as "an individual's belief in his or her own ability to organize and implement action to produce the desired achievements and results" (Bandura, 1997, p. 3). The theory is based on a socio-cognitive perspective, looking into how individual's experience, modeling, social persuasion, and physiological factors can predict performance outcomes. These psychological theories (and also Self-Determination Theory by Deci & Ryan, 1985, 2009) are overlapped in some ways as many factors are involved but are

useful to understand human's thoughts, emotions, and behaviors.

Research into CALL have integrated EVT to measure teachers/learners' adoption and persistence of technology use to achieve pedagogical outcomes. For example, Bat et al. (2019) combine TAM and EVT to evaluate Hong Kong based primary English teachers' continuance intention to use technology in their teaching practices. They found that intrinsic value and utility value are the most significant factors affecting the teachers' sustaining usage. The Expectancy-Value Theory helps explore the interrelationship between expectancy and value that shape motivation to complete a task by looking from various factors. In this way, it can be applied to explain the reasons why an individual engaged (or did not engage) in a certain activity.

2.6.3.2 Cognitive Dissonance Theory

Festinger's (1957) theory of cognitive dissonance is one of the most well-known theories in social psychology. The theory explains attitudes change when inconsistent cognitions occur, according to Aronson (1979), he cleverly explains the notion clearly:

> Dissonance is a negative drive state which occurs whenever an individual simultaneously holds two cognitions (ideas, beliefs, opinions) which are psychologically inconsistent. Stated differently, two cognitions are dissonant if, considering these two cognitions alone, the opposite of one follows from the other. Since the occurrence of dissonance is presumed to be unpleasant, individuals strive to reduce it by adding "consonant" cognitions or by changing one or both cognitions to male them "fit together" better; i.e., so that they become more consonant with each other. (p. 2)

The typical example can be found in The Fox and the Grapes in *Aesop's fables*, in which a fox attempted to eat a bunch of mouthwatering grapes hanging on a tree but he failed to reach them. Consequently, the fox then concluded the grapes are "sour" that he would rather not to eat. In regard, the theory is useful to see when an individual act or say something contrast to his/her attitude, they will tend to change his/her opinion so as to become consistent. And the larger pressure he/she feels, the more likely he/she will have such reaction to reduce the discomfort.

The theory of cognitive dissonance may help explain why some CALL researchers hold optimistic attitudes toward technology claiming what they have done are "effective" or "my students loved it," simply because they have put effort into the usage/research (see also Colpaert, 2012). Even though they might find some problems, they might tend to believe what they want to believe.

However, Aronson (1979) notes the flaws of Festinger's cognitive dissonance theory, claiming that "it lacks the elegance and precision that are commonly associated with scientific theorizing" (p. 2). Since it cannot be physically observed, it may lead to a subjective assumption. Also, McLeod (2018) implies individual differences, as highly anxious people are more likely to have such reactions, and most people are able to get through their dissonance in different ways from those predicted by the theory.

As the literature has shown, there are myriad factors that are thought to have contributed to the current attitudes towards not only CSL but also the use of technology in teaching it. These pertain to the history of how Chinese has been taught and is viewed in Japan as a second language, along with a range of societal and psychological factors. Technology in itself has had an impact on the processes and products of language

teaching, and we are in a period of flux as both teachers and learners familiarize themselves with these ongoing changes. The research methodology used in the study is presented in the next chapter.

Chapter 3. Research Methodology

This study aimed to explore teachers' and students' perceptions and usage of technology for foreign language education in a natural setting. Thus, a small group of the participants were involved in the study to discover deeper insights into the factors affecting their decisions. This chapter outlines the research design in terms of the research context, sampling methods, research processes, as well as the data collection and analysis methods.

3.1 Research Questions

RQ 1. What are the teaching contexts before and after Moodle implementation?

> 1.a What materials, devices, teaching process, and teaching approach are used in the four CFL courses before Moodle is introduced?

> 1.b Do the teaching contexts change after Moodle is introduced? If so, what are they?

> 1.c Do the teachers and students engage in online materials and Moodle? If so, how?

RQ 2. What factors influence the teachers' decisions in technology integration?

> 2.a What are the teachers' perceptions of integrating technology into CFL courses?

> 2.b What other factors affect teachers' implementation of educational technology?

RQ 3.   What factors influence the students' engagement in online materials and Moodle?

    3.a What are the students' perceptions of technology integration into CFL classrooms through Moodle?

    3.b What other factors predict students' engagement with educational technology?

3.2   Research Design

3.2.1 Mixed Methods Research (MMR)

There have been two camps of research approaches for a long time, these are quantitative and qualitative researchers. However, in the 1980s a third camp emerged along with quantitative research and qualitative research, which is now recognized as Mixed Methods Research (MMR) (Drew et al., 2008; Terrell, 2016). According to Creswell and Clark (2011), MMR is regarded as a combination of quantitative and qualitative approaches in a study, in order to have a better understanding of complex research questions than through either method alone. Thus, MMR was adopted for the current study to draw strengths from both quantitative and qualitative approaches.

Quantitative researchers who hold a hypothesis to measure data with deductive methods believe that quantitative approaches are objective which follow prior theories or models. In this sense, it assumes the researchers will be neutral, so they do not interpret results with their values. However, it is difficult to separate the researcher's role from a natural setting, and there have been criticisms that the positivist paradigm does not take the social reality into account. Also, it is impossible to seek a deeper understanding of human actions in a particular phenomenon that is limited by the formulated hypothesis

(Rahman, 2017). Therefore, qualitative approaches were also used in the current study to compensate for the weakness of quantitative approaches. Since the participants have varied perspectives, this study used mixed methods carried out with various data sources to give a better understanding of the participants' values, beliefs, and experiences in the specific teaching contexts.

To design MMR, Brown and Coombe (2015) state that it is not merely a combination of qualitative and quantitative approaches without a systematic process, but a way to answer research questions with both qualitative and quantitative data that are collected simultaneously. They further categorized the continuum of different types of MMR to visualize the balance of qualitative and quantitative methods (**Figure 11**). This study adopted a qualitative dominant mixed methods approach to investigate teacher and learner perceptions in-depth. The participants' background information and attitudes towards technology (RQ.2 and RQ.3) were conducted through three phases of longitudinal surveys to measure objective data, along with the interpretivist paradigm through interviews and field notes (taken from meetings and training) to interpret the participants' beliefs and values. Meanwhile, in order to observe the participants' actual educational environment and their engagement in Moodle, classroom observations and online user patterns were essential. However, due to the complexities of natural settings, not every single aspect of reality can be observed. Thus, the realist paradigm was used to answer RQ.1. Brown and Coombe (2015, p. 81) suggest that MMR researchers "go back and forth between the qualitative and quantitative data repeatedly looking for convergence, divergence, elaboration, clarification, exemplification, and interaction." In this sense, the factors which affected the participants' behavior and decisions were compared across the data above. A brief category of the methods applied in the current

study and the data sources were shown in **Table 12**, and the data collection and analysis methods were discussed later, in Chapters 3.5 and 3.6.

Figure 11 *A continuum of research types from pure qualitative to pure quantitative (adapted from Brown and Coombe, 2015, p.79).*

Pure Qualitative	Qualitative Mixed	Pure Mixed	Quantitative Mixed	Pure Quantitative
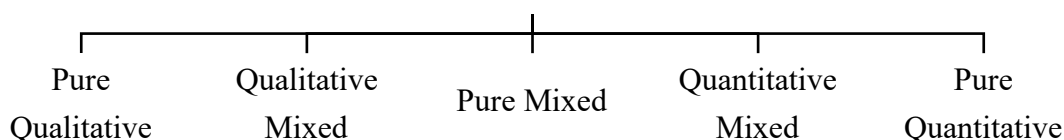
Table 12 *A brief description of methods used*

Instrument	Type	Focus	Targeted data
Surveys	Quantitative	Exploring teachers' and students' perceptions	Background information and perception (expectations, attitude changes etc.)
Moodle logs	Quantitative	Engagement of actual usage	User patterns and usage behavior
Interviews	Qualitative	Exploring teachers' and students' perceptions	Attitudes, beliefs, values and the reasons behind these
Classroom observations	Qualitative	Understanding of practical teaching environment	Teaching process, materials used, technology used or unused
Documents and field notes	Qualitative	Exploring teachers' and students' perceptions	Beliefs, emotions, needs, and deficiency

To integrate qualitative and quantitative components, a convergent design (

Figure 12) is suggested by Creswell and Clark (2011, p. 79). The strategies of mixing

two sets of data are further stated as:

(1) merging the two data sets

(2) connecting from the analysis of one set of data to the collection of a

second set of data

(3) embedding of one form of data within a larger design or procedure

(4) using a framework (theoretical or program) to bind together the data sets

(Creswell & Clark 2011, p. 66).

Following these, the current study collected qualitative and quantitative data

concurrently but analyzed them separately. The prior findings derived from both types

of data were merged to compare qualitative themes (i.e., expectations) with quantitative

results (i.e., actual usage). In this way, a broader picture of the participants' perceptions

(i.e., technology integration or reluctance) was achieved with the interpretation of the

two sets of results.

Figure 12   *Convergent mixed method design (adapted from Creswell & Clark, 2011,*

p. 118).
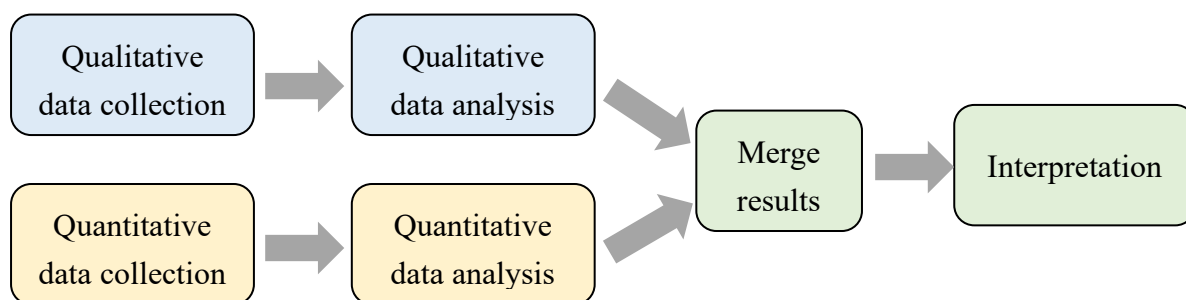
3.2.2 Ethnographic Research

As mentioned in earlier in the thesis, the study started as an ethnographic exploration of the use of technology in a CSL context to explore the perceptions of both teachers and learners. Ethnography is an in-depth, long-term, systematic study of a particular group of people or cultures, which emphasizes the use of immersive observation in natural settings (Palfreyman, 2015). Since the findings varied from an artificial environment and the real world, Nunan (1992, p. 53) suggests exploring behavior "in the natural contexts in which it occurs, rather than in the experimental laboratory," especially in educational contexts. Also, ethnographic researchers often spend a considerable amount of time with their subjects to gather a wide variety of data, which is collected mainly through observation and interview. Palfreyman (2015, p. 147) states that by doing so, the researchers can discover the truth 'under the surface' of what they observe. Based on the above considerations, though ethnographic study takes a longer time than other types of studies, long-term involvement with the teacher and student participants is worthwhile. By creating social relationships with them in natural settings, insights are gained into the complexity of participants' perspectives.

In attempting to conduct ethnographic research, every event and information in the setting were recorded as comprehensively as possible to avoid bias (Palfreyman, 2015). In addition, field notes and documents complementary to the primary data were also kept as secondary data sources. In this sense, I utilized various types of tools to collect data, which are briefly described in the following table:

Table 13 *Summary of ethnographic data collection methods*

Type of data	Data collection tools
Primary sources	
Interviews	Audio recording, note taking
Classroom observations	Audio recording, observation sheets
Moodle logs	Usage log recording within the system
Secondary sources	
Field notes	Note taking from workshop and meetings, researchers' personal thoughts
Documents	Photocopies, screenshots, emails, teaching materials

As the data were collected, however, the complexity of the range of factors became obvious to the researcher, and it became necessary to try to identify patterns in the data to determine how these factors related to one another. In order to do this, the data were analyzed using a Grounded Theory Approach, as described later in Section 3.5.3.

3.3 Subjects and Settings

3.3.1 Sampling Type

This study aimed to explore teacher and student perceptions of technology integration in the university setting. As discussed in the previous chapter (Chapter 2. Literature Review), teacher participants in such kinds of research are generally secondary school teachers, new teachers, or trainee teachers. Thus, the current study targeted a small sample of university teachers who had significant experience of teaching in Japan. In order to conduct ethnographic research, the researcher had to be frequently involved with the participants in their classrooms. However, as a PhD student, the researcher had difficulty in finding teacher participants. Also, aiming to look deep into the participants' perceptions and to exclude external factors (such as technical equipment, varied from

one university to another), a small sample of participants in less diverse teaching contexts in terms of similar teaching environments and backgrounds was preferable. Therefore, convenience sampling, which is defined as a nonprobability method to select a population that "just happens to be in a given place at a given time" (Terrell, 2016, p.75), was applied to obtain the participants. The steps of this sampling are as follows:

The researcher had a meeting with four potential teacher participants (1) to introduce this research; (2) to invite them to participate in this study; (3) to explain the research procedures that they and their students would have to take part in; (4) to request permission to observe their classes; and (5) to get permission to collect data from surveys, interviews, and classroom observations. Each of the four professors volunteered to take part in this research and allowed the researcher to have access to their students in the classes they were responsible for. Eventually, four professors and their first-year students (n=199) were readily available with the use of convenience sampling.

3.3.2 Research Context

As mentioned in the literature review, educational context shapes teaching and learning outcomes, experiences, and interactions. It is necessary to understand the compositions of the research context; therefore, the three internal nested contexts in **Figure 13** are articulated below:

Figure 13 *Three components of the educational context*

```
           Institution
          (Department)

            Teacher
           Community

            Classroom
```
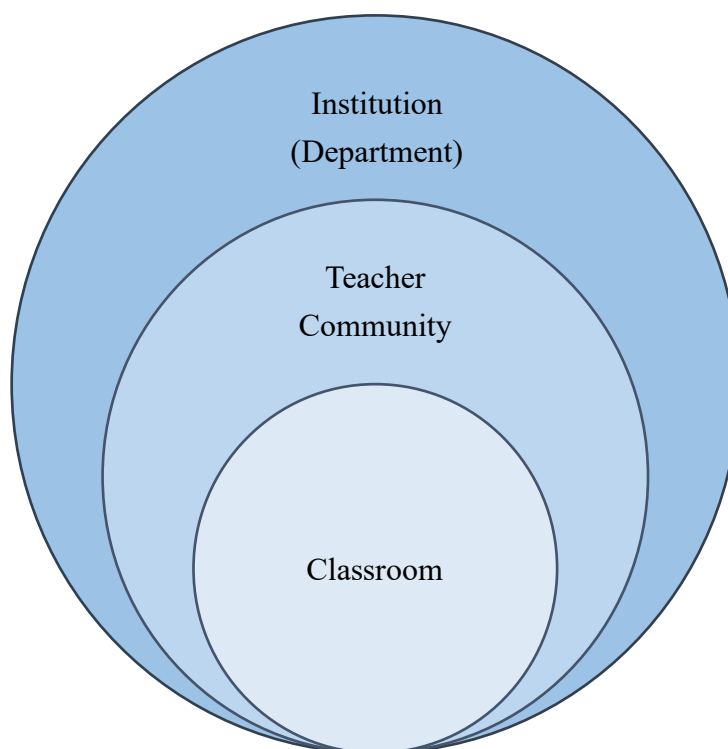
Institutional context: policy and teaching conditions

The department in which the four teachers teach was a non-Chinese major department providing seven foreign language classes: English, German, French, Chinese, Russian, Spanish, and Korean. As a feature of learning various foreign languages aside from the major subjects, students in the department are required to choose two of the language courses as compulsory subjects with a total of 18 credits for graduation. The students tended to enroll in an English course, which is a subject they had been learning from primary school, and most of them chose the Chinese course as their second foreign language because of the Chinese economic boom. (Further reasons for their choice of language courses will be discussed in Chapter 4 and Chapter 5, which are based on their survey response.) According to the department's policy, there are two types of Chinese courses distinguished by learning experience: one is for the students who have not learned Chinese, and another is for those who have learned the language before

(see **Table 14**). The student who takes the former course type is expected to take the class from the first semester to receive a total of 10 credits; the latter course type offers eight credits. Also, the department allows freedom to teach; that is, the teachers are able to use their preferred teaching approaches and materials.

Table 14 *Guidelines of Chinese course enrollments*

Year	Semester	New Learner (未習)	Experienced Learner (既習)
		Class level: Class title (credit)	Class level: Class title (credit)
1st	Spring	Beginner I:	Intermediate I:
		Basic (2), Seminar (1)	Step (2), Advanced (1)
	Fall	Beginner II	Intermediate I:
		Basic (2), Seminar (1)	Step (2), Advanced (1)
2nd	Spring	Intermediate I:	Intermediate II:
		General (1), Communication (1)	Tutorial (1), Chinese law (1)
	Fall	Intermediate I:	Intermediate II:
		General (1), Communication (1)	Tutorial (1), Chinese law (1)
3rd & 4th		Advanced: Tutorial (1), Intermediate II: Tutorial (1), Intermediate II: Chinese law (1),	Advanced: Tutorial (1)

Note. The classes marked in gray blanks are elective subjects.

(2) Teacher community

As the teacher community is nested within the department, the faculty has regular meetings according to the policy. It was assumed that the four teachers discussed administrative work in meetings, as well as shared their professional experiences and exchanged teaching strategies in the workplace. In other words, the four teachers were able to influence the department decisions and the classroom practices. Also, based on the policy, some of the classes have two teachers responsible for teaching students at the same levels. For example, in the first-year beginner class for new learners, one

Japanese teacher (non-native) teaches Basic Chinese twice a week, and one Chinese teacher (native) teaches a Chinese seminar once a week. In the current study, the three Japanese teachers cooperated with three different Chinese teachers; however, the Chinese teachers were part-time teachers. Unlike the four full-time teachers, they were relatively difficult to access (i.e., not on the campus most of the time), so they were not recruited into the study. However, the interrelationships between the native and non-native teachers in terms of teacher community will be discussed further in Chapter 5.

(3) Classroom settings

In order to have an in-depth investigation on teaching practice and interaction in terms of the classroom context, four classes taught by each of the teachers were randomly selected through the convenience sampling method. The four teachers had two 90-minute classes per week that I planned to investigate. Since some of the class periods overlapped, finally, four 90-minute classes of each teacher were arranged as shown in **Table 15**. Considering that the teachers opened courses for specific levels due to the policy (i.e., Japanese teachers only teach first-year students), this study followed up with the teachers rather than the students. Also, the students have a different teacher after two semesters of learning and will be dispersed to various classes, which might make the sample size uncontrollable. Therefore, this study focused on eight classes taught by the four teachers across three semesters. The names of the participants and the university were encoded throughout the study to protect their privacy.

Table 15 *Classroom settings*

Teacher	Teacher A	Teacher B	Teacher C	Teacher D
Student type	Experienced learner	New learner	New learner	New learner

Course name	Intermediate I: Step	Beginner I, Beginner II	Beginner I, Beginner II	Beginner I, Beginner II
Class period	90 mins/week	90 mins/week	90 mins/week	90 mins/week
Number of class	2 classes	2 classes	2 classes	2 classes

3.3.3 Participants

To focus more specifically on teachers' and learners' attitudes and behaviors, a small group of participants was involved in this study, including four teachers with varied experience of using educational technology, as well as their undergraduate students (n=199). The students were learning Mandarin Chinese as a foreign language at a private university in Japan, and the teacher participants (n=4) were four university teachers in the same faculty. Teacher A taught two classes of students (Class A1, Class A2) who were at an intermediate level and had been learning Chinese since high school. The other three teachers taught students who were at a beginner Chinese proficiency level. Teacher and student participant groups were coded in

Table 16 for a total of four teachers and 199 students. Note that the student groups were different from the 2018 and 2019 academic years. In the 2019 fall semester, three new students enrolled in Class B2 which increased the total class number. Besides, some of the students in Class C2 and Class D2 dropped from the spring semester in 2019; owing to this, the number of students decreased in the fall semester of 2019.

Table 16 *Participant distribution*

Semester	Teacher A	Teacher B	Teacher C	Teacher D
2018 Fall	Class A1(n=20)	Class B1(n=25)	Class C1(n=22)	Class D1(n=24)
2019 Spring	Class A2(n=13)	Class B2(n=27)	Class C2(n=31)	Class D2(n=34)
2019 Fall	Class A2(n=13)	Class B2(n=30)	Class C2(n=21)	Class D2(n=29)

It should be emphasized that nationality and gender differences were not considered in the current study to avoid stereotyping and bias. For this reason, related questions were not asked throughout the surveys and interviews, unless the participants mentioned their national or sexual identity themselves. According to teacher responses, the vast majority of the participants were Japanese, and only a few of them were *Haafu* – born to one Japanese parent and one non-Japanese parent. Also, one student in Class C2 was Korean but fluent in Japanese. To have better interactions with the participants and to prevent conflicts and problems in communication in this specific context (Filep, 2009), the research was conducted in Japanese as the primary language and Mandarin Chinese as a sub-language. For example, the student interviews were carried out in Japanese for the sake of their dominant language.

3.4   Research procedure

The current research was set up as a long-term study for a total of three semesters (one and a half years) to collect the data. As clarified in **Figure 14**, in the first semester (Fall 2018), a meeting with the four teachers was arranged to obtain their permission for this research. After obtaining permission, the researcher started to observe the teachers' classroom practice, and distributed teacher and student pilot surveys to investigate their needs for online materials. By doing so, the researcher was able to develop the materials in the Moodle system according to their needs. After setting up Moodle, a workshop and individual meetings were held to train the teachers on its usage. At the beginning of the 2019 Spring Semester, a student pre-survey and training on Moodle were conducted, and Moodle was beginning to be applied to the four classes subsequently. By the end of the 2019 Spring Semester, a student mid-survey and groups of student

interviews were carried out to see if they had difficulties with the usage. In the final semester (Fall 2019), a post-survey and group interviews were executed to investigate the change in their attitudes with time. Each of the instruments mentioned above will be further illustrated in the following sections.

Figure 14 *A Gantt chart of the research procedure*

Year	2018				2019						
Research Project	Fall Semester				Spring Semester				Fall Semester		
Survey	Pilot survey (T, S)				Pre-survey (S)		Mid-survey (S)				Post-survey (S)
Interview							Interviews (S)				Interviews (T,S)
Classroom Observation	Classroom Observation (T,S)										
Moodle Implementation	Meeting (T)	Development		Teacher training (T)	Learner training (S)		Deployment (T,S)				

Note. T=teachers, S=students

3.5 Data Collection Methods

3.5.1 Quantitative Data

3.5.1.1 Surveys

In order to measure the participants' perceptions of technology use for language education, it is necessary to investigate their (1) background information of teaching/ learning and technology devices, (2) motivation for teaching/ learning, and (3) attitude toward technology. A *Pilot survey* was conducted with the four teachers and 91 students in the 2018 Fall semester to gain information and improve upon the primary data collection methods. After adjusting, a *Pre-survey*, *Mid-survey*, and *Post-survey* were carried out across a period of time to examine the participants' dynamic attitudes. As

discussed in the previous sections, so far, most of the CALL research in motivation adopts the Technology Acceptance Model (TAM) as a quantitative instrument. However, it has been criticized with a lack of motivational factors in language pedagogy, leading to biased results. For this reason, this study used this model in combination with motivation in language learning to design the surveys.

In motivation research, the most common tool used to collect data is questionnaires, which are useful to "assess the attitudinal/ motivational disposition of L2 learners in various geographical, sociocultural and institutional contexts, and to compare the results of various subpopulations of learners" (Dörnyei & Ushioda, 2013, p. 213). In addition, surveys are useful to assemble data from a large population. As an outsider who did not teach the eight classes of the students (n=199), the researcher employed surveys as one of the main tools to investigate learner perceptions for the sake of effectiveness. Also, to avoid interrupting their formal instructions, the surveys were designed concisely. Following Gardner's (1985) Attitude/Motivation Test Battery (AMTB), the surveys adopted a Likert scale to evaluate the participants' motivation, expectations, and attitudes towards language education and technology integration. Although more items are provided, and more internal concepts could be assessed, limited time was available (Tremblay, 2001). Therefore, this research applied a shorter version of AMTB, the mini-AMTB, with a smaller number of Likert items for the sake of time constraint and short attention during the class time (Masgoret, Bernaus, & Gardner, 2001).

(1) Pilot survey

Teacher pilot survey

The survey for the teachers (n=4) was designed in Japanese with Chinese and English annotations, including two sections (**Appendix B**), which comprise statistical questions characterizing their background information (9 items) and a 5-point Likert scale measuring attitude towards educational technology integration (15 items).

In the first section, interval data (1 item) and nominal data (8 items) were collected. The former refers to the years of teaching experience; the latter is multiple-choice questions (7 items) and one open-ended question asking their name. The seven multiple-choice questions investigate their device(s) ownership, their experience of learning and teaching with technology, as well as the language skill(s) and the tool(s) they have used for Chinese teaching and learning. The second section collects ordinal data (15 items) to measure the teachers' agreement on their digital literacy, interest, beliefs, and confidences in technology use, as well as a statement of the teaching contexts. The Likert scale ranges from 1 to 5 (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = disagree, 5 = strongly disagree).

Student pilot survey

The pilot survey for the students (n=91) was in Japanese (**Appendix C**), including three sections: their Chinese learning background (4 items), their experience of using technology for Chinese learning purposes (4 items), and an agreement scale (5 items). First, open-ended questions were given to ask the duration of their Chinese learning experience, as well as their reasons and goals for learning the language. Their interests in the Chinese language and culture were also investigated with a checkbox allowing multiple answers. Secondly, four multiple-choice questions identified student device(s) ownership and experience of using

technology for Chinese learning. Finally, considering that the participants tended to give neutral responses in such contexts, a five-point Likert scale was modified to a four-point scale to force them to respond to a specific opinion (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree). Again, due to time constraints, only five items were addressed to determine their willingness and ability to use online Chinese materials.

(2) Pre-survey

Refining the pilot survey, the main surveys had been improved with more specific questions. In the pre-survey (n=105) (**Appendix D**), the structure of three sections remained the same, including their Chinese learning background (4 items), their experience of using technology for Chinese learning purposes (4 items), and an agreement scale (6 items), but some of the questions were modified. For example, in the first section, the item (Q2.) asking reasons for choosing the Chinese language was changed from a fill-in-the-blank question to a multiple-choice question, since most of the students did not reply in the comment. The choices were based on the responses from the pilot study, and a choice of 'no specific reason' was also provided to determine amotivation (without any specific motivation). For the same reason, item 4 (Q4. *What are you interested in regarding Chinese language and culture?*) also added a 'no specific choice' in order to develop the materials that the students might be interested in; more choices were supplemented. Also, according to the findings in classroom observations, electronic dictionaries were found to be widely used in class. Thus, 'electronic dictionary' was added to the options of device(s) ownership (Q5. *What device(s) do you have?*). In addition to these, since most of the participants were just starting to learn Chinese, the items (Q6. and Q7.) asking their experience of using technology to learn Chinese were revised to foreign

language(s). In the Likert scale section, to understand students' willingness to use technology outside of class, an item (*Q9. I want to use technology to study Chinese after class.*) was added.

(3) Mid-survey

The purpose of the mid-survey (n=103) (see **Appendix E**) is to understand student attitudes towards online materials and Moodle during their actual use. However, since some of the participants had not used Moodle, the survey also investigated the reasons behind their usage.

The first section (4 items) includes two types of questions, which are: (a) two multiple-choice questions asking their interest in informal learning (Q1.), and their problem problem-solving strategies when faced with Chinese learning difficulties (Q2.), and (b) two fill-in-the-blank questions on why they do or do not use Moodle (Q3), and suggestions about what content they want to learn through Moodle or any comments they would like to provide.

The second section was a four-point Likert scale (31 items), which aimed to identify the students' beliefs on technology and Moodle use inside and outside of the class; also, to know how they perceive the teacher and the institution. At the end of the survey, the students were asked if they were willing to volunteer for the interview.

(4) Post-survey

The post-survey (n=92) **(Appendix F)** is slightly longer than the prior questionnaires, including two sections with open-ended questions (10 items) and an attitude scale (33 items). The main focus in the first section was on the sustainable

motivation of learning Chinese with technology. The respondents were asked if they would continue learning the language (Q1.) and what their perceived motivation for learning was (Q2.). Three items (Q3, Q4, Q5) were raised to investigate what (language skills) and how (tools) the students learn out of class; three items (Q6, Q7, Q8) were to know their experience and willingness of using the SNS they used in daily life for learning Chinese. Two items (Q9, Q10) were to ask their experience of and comments on Moodle. To compare the prior attitude (before use and during use) with after use, the attitude scale in the second section was almost the same as the mid-survey. Only two items (Q32, Q33) were added to ask the students if they were satisfied with the teacher/learner training in the institution. Same as the mid-survey, the final question was to ask their intention to attend the last student interview.

3.5.1.2   Moodle Logs

In order to measure the participants' engagement in the online materials (RQ. 1.c), behavioral observation data outside of the classroom was imperative. Considering that actual behavior is usually different to self-predictions, the activity reports feature within Moodle was used to record their actual usage patterns (Griffin, 2011). In other words, the teachers' and the students' time spent, material assessments, activity contributions, and interactions in terms of engagement were all automatically recorded (see **Figure 15**). At the end of the period, the number of logs was counted as the frequency of use. Note that the statistical data was available to the four teachers. They could see their students' log data, but they could not see each other's class logs. In contrast, the students were unable to see the teachers' or the other students' logs. In addition to engagement frequency (overall time), the quantities of developed contents, assessed activity types,

and interactions among the participants were also collected through the built-in logs to determine the participants' behaviors.

Figure 15 *Usage logs on Moodle*

The lack of connections between educational research and design practice has been criticized (Herrington, Reeves, & Oliver, 2010; Wang & Hannafin, 2005). Since different teachers might have different teaching approaches, and the students might have varied learning interests, the development process of the online materials was based on design-based research. Design-based research, also called design experiments or educational design research, is defined as:

> a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually sensitive design principles and theories. (Wang and Hannafin, 2005, pp.6-7)

In this sense, the materials in Moodle were developed according to the participants'

advice retrieved from surveys, meetings, training, and observations. The four phases of

Moodle design can be seen in **Figure 16** and **Table 17**.

Figure 16 *Four phases of design research (Reeves, 2006, p. 59)*

| Analysis of practical problems by researchers and | → | Development of solutions informed by existing design principles and | → | Iterative cycles of testing and refinement of solutions in | → | Reflection to produce "design and principles" and enhance |

Refinement of problems, solutions, methods, and design principles
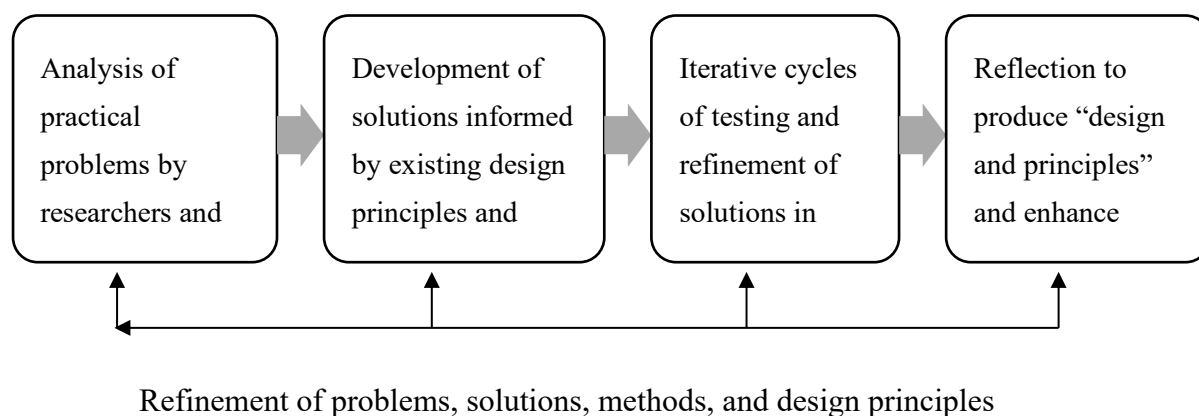
Table 17 *Online materials through Moodle Design Phases*

	Purposes (Herrington et al., 2010, pp. 7-14)	Research activities
Phase 1 Analysis	"[T]o identify and explore a significant educational problem."	− Meetings with the teachers − Surveys − Classroom observations − Interviews − Emails
Phase 2 Development	"[T]o create particular learning tasks or address particular problems" and "to consider the best way to deliver or operationalise the intervention within the e-learning environment."	− Developing materials according to the participants' responses − Teacher and student trainings
Phase 3 Implementation and evaluation	"[A]fter the first implementation and evaluation, changes are made to the learning design to further improve its ability to address the problem."	− Classroom observations − Moodle logs tracking

Phase 4 Reflection	"[T]o reflect on the entire process to produce design principles that can inform future development and implementation decisions."	– Field notes	

According to the teacher participants' responses in phase 1, the courses on Moodle were divided into two types: formal and informal courses (**Table 18**). The formal courses were run by the teachers, who were authorized to add class contents, provide feedback to their students, and check students' activity logs. Generally speaking, the researcher set up formal classes in Moodle to meet the teachers' needs for formal teaching materials. In addition, informal courses were provided as a supplement, according to the students' learning goals and interests provided in the pilot survey. The contents were categorized into vocabulary, grammar, pronunciation, reading, conversation, and culture, with an unstructured syllabus set up by the researcher. All the teachers and students were able to access the informal courses, and the teachers were able to add any content they liked. The researcher also created new content for the teachers and students that followed the design phases mentioned above.

Table 18 *The course types in Moodle*

Course Type	Course Name	Teacher	Student
Formal (Related to formal class)			
	Course A	Teacher A	Class A2 (n=13, 13)
	Course B	Teacher B	Class B2 (n=27, 30)
	Course C	Teacher C	Class C2 (n=31, 21)
	Course D	Teacher D	Class D2 (n=34, 29)
Informal (Supplements to formal class)			
	Others	All teachers (n=4)	All students (n=105, 93)

Note. The numbers of students (n= Spring semester, Fall semester).

There are various types of activities in the standard Moodle platform, providing synchronous (i.e., chat) and asynchronous (i.e., content sharing, forums, wiki, text message) activities. It also allows plug-ins to support further kinds of teaching activities. In the teacher training, five main types of activities (**Table 19**) were introduced along with the example usages (see **Appendix G**). The development and engagement of the various activity types were collected within Moodle logs as well.

Table 19 *Various activity types introduced in teacher training (retrieved from the Moodle webpage)*

Activity types		Descriptions
1. Assessment	Assessment	Enable teachers to grade and give comments on uploaded files and assignments created on- and off-line
	Quiz	Allows the teacher to design and set quiz tests, which may be automatically marked and feedback and/or correct answers shown
2. Survey	Feedback	For creating and conducting surveys to collect feedback
	Choice	A teacher asks a question and specifies a choice of multiple responses
	Survey	For gathering data from students to help teachers learn about their class and reflect on their own teaching
3. Communication	Chat	Allows participants to have a real-time synchronous discussion
	Forum	Allows participants to have asynchronous discussions
4. Collaboration	Wiki	A collection of web pages that anyone can add to or edit
	Workshop	Enables peer assessment
5. Text and File	URL	For sending the student to a webpage they can reach on their browser

File	For delivering a picture, pdf document, spreadsheet, sound file, or a video file
Folder	For helping organize files; one folder may contain other folders

3.5.2   Qualitative Data

3.5.2.1   Classroom Observations

In order to explore the participants' beliefs, barriers, and values of adopting technology in teaching practices, I constructed systematic classroom observations (Brown & Coombe, 2015; Wajnryb, 1992). The primary purposes of the observational study are:

1. to identify the classroom phenomenon (what materials and technology devices were being used);

2. to identify the pedagogical process in natural settings (teaching approaches and learning outcomes);

3. to verify the dynamics that occurred (if teaching methods changed); and

4. to provide more evidence to other data sources.

Furthermore, what people say often differs from how they act. The observational data is useful to explain the motivation behind actions (RQ.2 and RQ.3), which is highly relevant to this study to explore the reasons for technology adoption or reluctance.

To collect the observational data, the researcher intended to act as a mere observer in the classes. However, due to ethical concerns, the researcher had to reveal the purpose of conducting the classroom observation to get the students' permission to collect the data. Since there is a potential risk of causing discomfort from having an outsider in their classrooms, the long-term observations were to gain the trust of the participants (Musante & DeWalt, 2010). Also, to obtain first-hand data by integrating into the social

setting, it is impossible to avoid any interactions with the participants, and it is difficult to observe "in an objective way without bringing to the observation prior attitudes and beliefs" (Nunan, 1989, p. 76). Therefore, the researcher was "observer as participant" (

Figure 17), which means that the researcher's identity was overt, and the students were aware of the observation activities. The main role of the researcher was to collect data and closely interact with the members, so the researcher took part in certain activities with the participants (Merriam & Tisdell, 2015; Gill and Johnson, 2002). The neutral position of the observer permitted reliability that the teachers and the students did not have to "choose sides" (see Babchuk, 1962) that is, the participants did not have to change their existing behaviors to obtain benefits under observation. For example, the students did not have to work actively to get a better score from the researcher, and the teachers did not have to change their teaching methods to receive a higher evaluation score from the researcher.

Figure 17 *The researcher's role in the classroom observations (retrieved from Gill & Johnson, 2002, p. 149)*

Participant
observation

Overt
research

Covert
research

Spectator
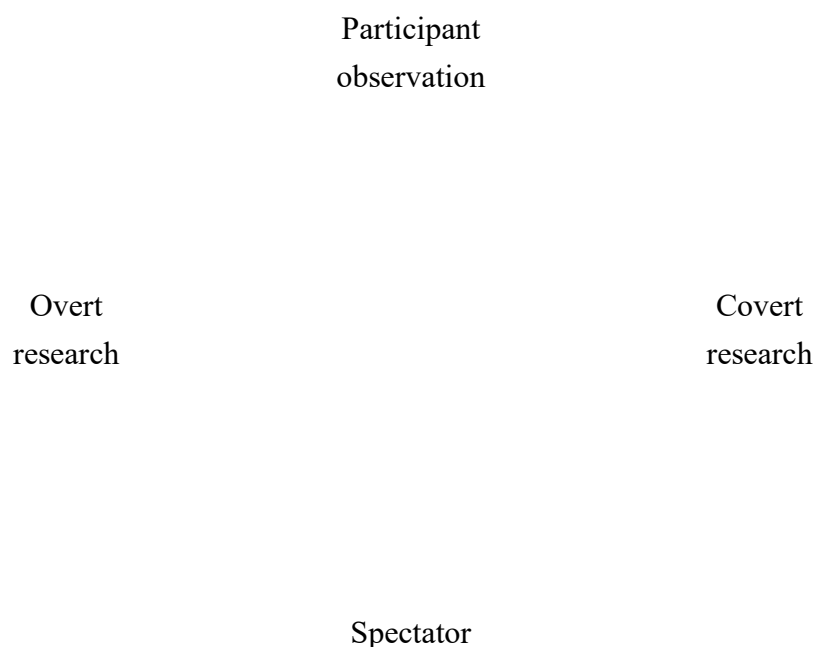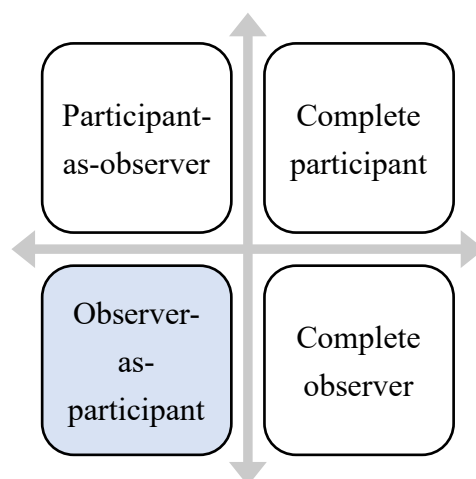
Since the classroom observations followed structural purpose with clear focus, recording and transcribing were not necessary (Nunan, 1989). An observation scheme was designed to collect narrative data (see **Appendix H**), which follows Wajnryb's (1992) framework. Seven main focuses, along with 13 items, were illustrated in **Table 20**. The schemes were completed during and right after the observations, as the action of taking notes might cause anxiety in the participants. Also, in order to write as fast as possible in real-time, the notes were taken in three languages (Chinese, Japanese, and English) and used symbols based on the researcher's note-taking strategies. For instance, "S" stands for a student, "T" stands for a teacher, and "=" means the same.

Table 20 *Observation scheme based on Wajnryb's (1992) framework*

Observation Focus (Wajnryb, 1992)		Observation Items
Materials and resources	1 a.	Materials and devices used
	1 b.	Technical difficulties
The lesson	2.	Teaching procedure
	6.	Atmosphere
Classroom management	3.	Classroom activity (pair and group work)
	10.	Interaction (teacher-student, student-student, student-teacher, teacher-researcher)

Learner	4 a.	Student response and engagement
	4 b.	Student motivation
Teaching skills and strategies	4 c.	Teacher response and engagement
	4 d.	Teacher motivation
Language	7 a.	The teacher's meta-language
	7 b.	The language of questions
Learning	11.	The learning environment
	8.	Assessment
	9.	Evaluation

Usually, there are 15 weeks in an academic term at the university. The times of classroom observations were different (**Table 21**) due to various reasons (i.e., holidays, lecture cancellations, examinations, conference attendance by teachers or researchers). As mentioned above, though each teacher had two class periods per week, some of the periods overlapped. The researcher selected one class period per week for convenience. However, Teacher C rejected the observation result from the first class in the 2019 Spring Semester, claiming that he was building relationships with the students. Incidentally, Teacher C opened a pronunciation class during lunch break and invited the researcher to teach with him. The five instances of a 30-minute informal class were also observed. Thus, a total of 137 formal classes, along with five informal classes, were observed. Before or after the classes, the researcher had an opportunity to talk to the participants occasionally. Therefore, the data from the talks supplements the observational data.

Table 21 *Classroom observation distribution*

Semester	Teacher A's Class	Teacher B's Class	Teacher C's Class	Teacher D's Class
2018 Fall	12	12	12	12
2019 Spring	10	12	1(+5)	13
2019 Fall	12	14	15	12

3.5.2.2   Interviews, Workshop, and Meetings

Interviews

In addition to classroom observations, Babchuk (1962) also suggests researchers conduct interviews to complement the observational data. By doing so, new solutions can be found to reform and gain more insights into the teaching contexts. In ethnographic research, an interview is a common method used to collect direct data from students and teachers with whom the researcher interacts (Nunan, 1989). Brown and Coombe (2015, p.210) point out that interviews "enable a profound understanding of the participants' opinions, beliefs, attitudes, experiences, and identities." In this sense, ethnographic interviews are quite relevant to the current study. The aims of the interview activities were: (1) to understand how the participants perceived technology integration for Chinese education (RQ.2 and RQ.3); (2) to clarify their motivation for using online materials and Moodle (RQ.1.c); and (3) to explore their reasons for resistance to change.

The interviews were undertaken twice: (1) the end of the 2019 Spring Semester (n=6) and (2) the end of the 2019 Fall Semester (n=9), with a total of 11 interviews (see **Table 22**). As mentioned previously, the interviews were carried out in the participants' dominant language and a sub-language for clarification or code-switching. The interviews also followed Babchuk's rules (1962, p.227), noting that the interviewer should be a listener rather than a speaker and should avoid personal judgment when listening. Actually, the interviews in the 2019 Spring semester were set up for the student participants, however, Teacher D insisted on attending. The teacher's presence in the interview might affect the way the students responded (Burns, 2009), but the data remained relevant to the study. Therefore, the researcher stated that the interviews were

nothing to do with their benefits (i.e., get an extra grade) beforehand.

Table 22 *Interview description*

Interview Date	Participant Code	Language Used	Recording Time
2019 Spring Semester			
Jul 25, 2019	Teacher D, Students #D11, #D19, #D26, #D29	Japanese	00:46:11
Jul 25, 2019	Students #B4, #B11	Japanese	00:24:15
2019 Fall Semester			
Jan 14, 2020	Teacher A	Chinese, (Japanese)	00:53:24
Jan 21, 2020	Teacher B	Japanese, (Chinese)	01:35:08
Feb 1, 2020	Teacher C	Japanese, (Chinese)	00:55:57
Jan 30, 2020	Teacher D	Japanese, (Chinese)	01:43:56
Jan 23, 2020	Student #C1	Japanese	00:26:54
Jan 23, 2020	Student #C3	Japanese	01:51:40
Jan 27, 2020	Students #D19, #D29	Japanese	00:27:27
Jan 27, 2020	Student #D11	Japanese	00:33:20

Before the interviews started, I asked the interviewees if they permitted the interview to be audio recorded with the use of a smartphone voice recorder. Although some of the participants claimed audio recordings made them nervous, all of them agreed to it eventually. To relieve their anxiety and to avoid interruptions, note-taking was seldom used during the conversations.

The interviews were carried out three times across the research period, including

1. student interviews after one semester of Moodle implementation (**Appendix I**);

2. teacher interviews after one year of Moodle implementation (**Appendix J**); and

3. student interviews after one year of Moodle implementation (**Appendix K**).

The semi-structured interviews contained both open-ended and closed-ended questions to gather various data flexibly. The focused questions were listed in advance but not

strictly followed, in order to obtain more interesting results in a natural flow of conversation. The focuses of the question items are briefly described in the following tables:

Table 23 *2019 Spring Semester: Student interview (n=6)*

Focus	Sub Focus	Interview Question Items
Experience of usage	Reasons for adoption/reluctance Barriers	1. Did you use the Moodle website or application? If so, what contents and what functions did you use? If not, what are the reasons?
	Usage habits	2. Did you find any difficulties with using Moodle (website/application)? When and where do you usually use it?
Beliefs	Beliefs about learning with technologies	3. What do you think about using a PC or smartphone to learn Chinese instead of a textbook?
Interrelationships among students, teachers, and technology	Role of students	4. What is the role of students in Chinese learning?
	Role of teachers	5. What is the role of teachers in Chinese learning?
	Role of technology	6. What is the role of technology in Chinese learning?
Others		7. Extended questions from survey (i.e., learning interest, learning style, teaching approach)

Table 24 *2019 Fall Semester: Teacher interview (n=4)*

Focus	Sub Focus	Interview Question Items
Usage experience	Usage habits	1. What are the types of technology in your daily life?
	Adoption/reluctance	2. Are you using Moodle? Why or why not?
	Barriers	3. What difficulties did you find or concerns did you have about using Moodle?
	Reasons for adoption/reluctance	4. Have you ever used The existing LMS? What were your purposes of using it?

Expectations	Support from the institution	5.	Are you aware the university will start using Moodle from next semester? If so, where did you get the information?
	Continuance usage intention	6.	Will you apply Moodle from next semester? Why or why not?
	Demand for teacher training	7.	Have you received training on using technology for language teaching?
Beliefs about teaching with technology	Role of the institution	8.	Do you think the university offers enough support and training for teachers and students? Do you have any suggestions for improvement?
	Devices ban in class	9.	Do you ban technology use in class? Why or why not?
	Problem-solving	10.	When you have problems with teaching or doing your job, what do you do?
	Impacts on teaching	13.	Do you experience any impacts of using technology for language instruction on your teaching?
Beliefs about learning with technology	Students' digital literacy	11.	How do you perceive your students use technology for learning?
	Students' motivation	12.	Do you expect your students are using Moodle?

Table 25 *2019 Fall Semester: Student interview (n=5)*

Focus	Sub Focus		Interview Question Items
Usage experience	Attitude	8.	What are your thoughts on The existing LMS/Moodle?
Learning experience	Learning styles	3.	How do you perceive collaborative learning?
	Learning motivation	4.	What are your formal and informal learning experiences?
Beliefs about learning with technology	Devices ban in class	5.	Do you think digital devices distract from your learning in and outside of class? Why or why not?
	Impacts on learning	6.	Do you think technology makes your language learning easier or changes your learning process?
Beliefs about teaching with technology	Teacher's digital literacy	1.	How do you perceive XX teacher's digital literacy, teaching skills, and language proficiency?
	Attitude towards teaching approach	2.	Do you think anything should be changed in class? If so, what?
	Attitude towards tracking through LMS	7.	Do you know that the teachers can see your engagement in Moodle? How do you feel about that?

Workshop and meetings

In order to train the teachers on Moodle usage, I held a workshop in a PC room to show them the functions face-to-face, so that they were able to try it and raise questions intermediately. Two of the teachers attended the workshop, the other two were unable to attend; thus, I provided individual training to them in their offices. Aside from the training, the teachers and the students were able to meet with the researcher to consult on Moodle's use, as well as teaching and learning problems. The problems they raised were also recorded through note-taking during the meetings to identify the participants' concerns, beliefs, and emotions, since it is a less intrusive technique (Burns, 2009).

3.5.2.3   Documents and Field Notes

Nunan (1989) suggests including lesson plans and field notes as supplementary data to the classroom observation scheme. Teaching materials and photocopies of the teachers' research work were also collected to understand the teacher participants' teaching and research focus in terms of their teaching motivation. In addition, emails sent back and forth between the teachers and students were gathered to see if there were any technical problems or requests for online materials. Screenshots of Moodle were used to understand how the participants engaged, which could not be seen on the quantitative data from logs. Moreover, based on the grounded theory, field notes of the researcher's thoughts and comments were taken throughout the research activities to add the researcher's own insights into the contexts.

3.6 Data Analysis Methods

As mentioned previously, the study applied mixed methods, so the qualitative and quantitative data were gathered and analyzed separately. The different analysis techniques can be seen in the following table:

Table 26 *Summary of data sources and data analysis methods*

Type	Data sources	Analysis technique
Quantitative	Surveys	Quantitative items: statistics
		Qualitative items: content analysis
	Moodle logs	Frequency count
Qualitative	Interviews	Content analysis
	Classroom observations	Content analysis
	Documents and field notes	Content analysis

3.6.1 Quantitative Data Analysis Methods

3.6.1.1 Surveys

Quantitative data obtained from the surveys including interval items (i.e., year of learning), checklists, multiple-choice questions, and Likert scales were calculated in different ways, according to the sample size. For example, it is hard to find the significance of the mean in a small sample size from the teacher survey (n=4), but it was useful to understand the average values from the large sample size of the students (n=199). Generally, quantitative data was calculated by the mean, mode, and sum. Qualitative data derived from open-ended comments (i.e., learning goals) was grouped into categories and then converted into quantitative data (content analysis). The data was analyzed through Microsoft Excel, using descriptive and inferential statistics.

Descriptive methods were carried out to summarize the participants' background information and to address their attitudes towards educational technology in various aspects (RQ.2). On the other hand, inferential statistics were used to see if the participants' attitudes changed before, during, and after Moodle use (RQ.3). The means of the 4-point Likert scale data collected from the student's pre-survey, mid-survey, and post-survey were compared.

3.6.1.2   Moodle Logs

Moodle's built-in data recorded 102,758 logs with 204 users (including the researcher) in 12 courses, which were retrieved from January 11, 2019, to May 1, 2020. As can be seen in **Figure 18**, the document contains a large amount of information, for example: present time, username, interacted user, activity access, and device use. In order to focus on the participants' activity logs, a massive amount of data was analyzed through the following steps:

1. Export log data from Moodle to Microsoft Excel based on various courses

2. Filter out data from the researcher and unknown users

3. Arrange data in the order of participant names

4. Count frequencies (login and logout time)

5. Categorize the users into different types

6. Categorize the component (activity types), event context, and event name that each type of user assessed frequently

Figure 18 *An example of Moodle logs exported to Microsoft Excel*

Time	User full name	Affected user	Event context	Component	Event name	Description	Origin	IP address
11/01/19, 17:01		-	Course: 機能紹介	System	Course viewed	The user with id '9'	web	
11/01/19, 17:00		-	File: 文件（ファイ	File	Course module viewe	The user with id '9'	web	
11/01/19, 17:00		-	Course: 機能紹介	System	Course viewed	The user with id '9'	web	
11/01/19, 17:00		-	URL: 网页地址（	URL	Course module viewe	The user with id '9'	web	
11/01/19, 16:59		-	Course: 機能紹介	System	Course viewed	The user with id '9'	web	
11/01/19, 16:59		-	Glossary: 词汇表	Glossary	Course module viewe	The user with id '9'	web	
11/01/19, 16:58		-	Course: 機能紹介	System	Course viewed	The user with id '9'	web	
11/01/19, 16:58		-	Forum: 讨论区（	Forum	Course module viewe	The user with id '9'	web	
11/01/19, 16:58		-	Course: 機能紹介	System	Course viewed	The user with id '9'	web	
11/01/19, 16:57		-	Chat: 聊天室（チ	Chat	Course module viewe	The user with id '9'	web	
11/01/19, 16:57		-	Course: 機能紹介	System	Course viewed	The user with id '9'	web	
11/01/19, 16:57		-	Choice: 投票（投	Choice	Course module viewe	The user with id '9'	web	
11/01/19, 16:57		-	Course: 機能紹介	System	Course viewed	The user with id '9'	web	
11/01/19, 16:57		-	Course: 機能紹介	System	Course viewed	The user with id '9'	web	
11/01/19, 16:56		-	Workshop: 互动评	Workshop	Course module viewe	The user with id '9'	web	
11/01/19, 16:56		-	Course: 機能紹介	System	Course viewed	The user with id '9'	web	
11/01/19, 16:55		-	Quiz: 测验（小テ	Quiz	Course module viewe	The user with id '9'	web	

3.6.2 Qualitative Data Analysis Methods and Coding Process

I collected the ethnographic data mainly in Japanese and Chinese. Since it is difficult to adopt a system that can analyze bilingual data, I managed the data in the original languages through Microsoft Excel. In order to code the data more effectively, I only translated the keywords and relevant quotes into English, following Filep's suggestion (2009). The qualitative data derived from different instruments and collected through different methods was analyzed separately.

3.6.2.1 Classroom Observations

Handwritten observation sheets were input into Microsoft Excel with the use of summative content analysis. The observation items were identified as keywords, and then each content in the cells was quantified as a frequency. Taking "materials use," for example (see **Figure 19**), the teacher used a textbook from week one to week four and used a smartphone in week 5. The materials used in this class were further identified as a textbook (80%) and a smartphone (10%).

Figure 19 *Sample of observation analysis*

	2018 Fall				
	W1	W2	W3	W4	W5
Date	2018.10.17	2018.10.24	2018.10.31	2018..11.7	2018.11.14
Numbers of students	20 (1 is late)	16	18	20 (3 are late)	18 (1 is late)
Materials use	A photocopy of textbook:《汉语口语速成 基础-下》	=	=	=	T1 forgot to bring her textbook to class, and went back to her office to get it. But she took the wrong one, so she took photos on S's textbook and used her smartphone as a textbook.
Devices use	T1: None; Ss: 1 uses a smartphone, a tablet and a electronic dictionary; nearly 5 uses smartphone and electronic dictionary	T1: None; Ss: 4 electronic dictionaries; 1 tablet	T1: None; Ss: 6 electronic dictionaries and ? smartphones	T1: None; Ss: 5 electronic dictionaries and ? smartphones	T1: smartphone; Ss: half of Ss smartphpnes; 5 electronic dictionary; 1 paper dictionary
Teaching procedure	(1) Checks L.14 HW answers by asking the students (picks up the names from attendance book), and making free conversations by role playing; (2) Ss reads L.15 vocabulary list aftet T1, T1 explains the meaning in JP, T1 asks Ss to translate the example santances from CH to JP); (3) T1 reads the texts and Ss recites them, and T1 calls Ss' names to translate the texts from	(1) Pairs to do free converstions (should use vocabularies and grammars that have been taught last week)	(1) Free conversation (20 mins); (2) T1 leds Ss to read vocabulary list; (3) Texts: Ss read, T1 explain the grammar in JP, Ss interpret; (4) Do exercises in the textbook	(1) Free conversation, Q&A; (2) Textbook: vocabulary, text, grammar	(1) Free conversation (45 mins): 3 pairs, topic: How many people are there in your family?; (2) Textbook: read vocabulary list, read texts and interpret by phrases

3.6.2.2   Interviews

Data from interviews were audio-recorded and transcribed in the original languages. Since the interview data was the primary source, the data was coded in two cycles: (1) InVivo Coding and Values Coding, and (2) Focused Coding.

First, the InVivo Coding approach was applied to code data that "prioritizes and honors the participant's voice" (Saldaña, 2015, p.106). At this stage, I underlined and simplified the participants' original words. Secondly, Values Coding was applied with InVivo codes in the second stage to "reflect a participant's values, attitudes, and beliefs, representing his or her perspectives or worldview" (Saldaña, 2015, p.131). Values codes were analyzed and translated into English as a use of category. Finally, Focused Coding (or selective coding) followed the first cycle coding methods and was used to "search for the most frequent or significant codes to develop the most salient categories in the data corpus" (Saldaña, 2015, p.131).

Table 27 *An example of interview transcripts coding procedures*

Start	Speaker	Contents	Invivo Coding	Values Coding	Focusing Coding
17:37	T	ただ、(1)スマホこの辞書の機能は、圧倒的には語彙は少ないし、用例も少ないですよね。だから、(2)学生が中国語を勉強する上で、必要な辞書はやっぱり中級、違う、中規模の語彙数がある辞書が必要なので、その場合は、あそにあるような(3)通常の辞書、及びあのコンテンツが入ってる電子辞書ならば、オッケーだようと。それ言ってんだよね。	(1)辞書の機能語彙、用例少ない (2)勉強上で、中規模の語彙数がある辞書が必要 (3)通常の電子辞書オッケー	Attitude towards electronic dictionary and smartphone used in class	Attitude: addopt with conditions

3.6.2.3   Documents and Field Notes

Documents and field notes taken in the workshop and meetings, as well as the researchers' own ideas, were supplementary to the primary data sources. Summative content analysis was adopted to investigate this data, which is "an attempt not to infer meaning but, rather, to explore usage" (Hsieh & Shannon, 2005, p. 1283). For example, textbooks were used to identify the teacher's beliefs and teaching approach. Overall, keywords and categories (i.e., attitude, adoption, reluctance, motivation) were derived from observation focuses, survey focuses, and interview focuses. New keywords that did not fit with the codes developed previously were also created during the analysis process. All the data mentioned above was connected and merged with the researcher's memo. This process will be explained further in the next sub-chapter.

3.6.3   Grounded Theory Approach

As described above, the study relied on a grounded theory approach to make sense of the intricate interplay of factors that became apparent as a result of the initial ethnographic analysis of the language teaching and learning context. Grounded theory is defined as a mixed-methods approach, applying both qualitative and quantitative data resources. It primarily utilizes qualitative data collected from interviews, observations, and documents to build a theory that is lacking (Hadley, 2017). Merriam and Tisdell

(2015, p. 32) stress that "grounded theory is particularly useful for addressing questions about process; that is, how something changes over time." In light of this, I used grounded theory to analyze the qualitative data collected from the research activities in order to explore the factors that affected educational technology integration in this specific context (RQ.2 and RQ.3).

Following the grounded theory approach, the data was analyzed with the following stages (**Figure 20**): (1) *open coding*: all raw data was read over and broken down to label the concepts and form categories along with subcategories; (2) *axial coding*: the conceptual elements and categories were compared to find the connections with a coding paradigm; and (3) *selective coding*: the related categories were selected as core categories. Note that if the data could not fit into the codes, new codes were generated, and the previous data was modified, which is the so-called constant comparative method (Hadley, 2017). Moreover, the timing of the literature review has been contended by grounded theory researchers. Glaser and Strauss (1967) suggest postponing the literature review until after data collection in order to avoid being constrained by assumptions. However, this requires high theoretical sensitivity to formulate a hypothesis. To avoid what previous studies have done and to gain more prior knowledge, the relevant references had been chosen as a potential coding frame (Dunne, 2011). Written memos were also used to support the analysis process.

Figure 20 *Data analysis procedure through the grounded theory method (adapted from Cho & Lee, 2014, p.9)*

Theoretical sampling

Based on concept

Data collection

· Observation

· Interview

· Visual material

review

Open coding

· Conceptual labeling

· Categorizing

Axial coding

· Finding relationship

between categories

Selective coding

· Selection of a core

category

· Checking conceptual

density

Memos

Field notes

Acquire conceptual details

Constant comparison

Between incidents, data, and theory

For precision & consistency

3.7   Reliability and Validity

LeCompte and Goetz (1982) point out difficulties of reliability and validity in ethnographic research, with which the study may not be replicated even using the same methods. They state that:

> Even if a researcher reconstructs the relationships and duplicates the informants and social contexts of a prior study, replication may remain impossible if the constructs, definitions, or units of analysis which informed the original research are idiosyncratic or poorly delineated. Replication requires explicit identification of the assumptions and metatheories that underlie choice of terminology and methods of analysis. (p.39)

That is, researchers taking different roles in a natural setting may acquire diverse data, and the findings are therefore interpreted differently. We all see the world differently with our own lenses, and this made the research interesting since it explored how the teachers and the students perceived educational technology in different ways.

However, to avoid research bias, the current study followed a set of four evaluative criteria (Lincoln and Guba, 1958 as cited in Creswell and Miller, 2000) to enhance trustworthiness: (1) credibility; (2) transferability; (3) dependability, and (4) confirmability, along with various other techniques (Hsieh & Shannon, 2005; Creswell & Miller, 2000; Nunan, 1992; LeCompte & Goetz, 1982;). The strategies are summarized in the following table.

Table 28 *Strategies used to enhance trustworthiness*

Criteria	Strategies	Strategies used in this research
Credibility (internal validity)	Prolonged engagement	Longitudinal observations in the contexts (1.5 years)
	Persistent observation	Building relationships with the participants
	Triangulation	Multiple data sources with various methods
	Peer debriefing	Receiving feedback from seminar members
	Negative case analysis	Even negative evidence was present
	Member checks	Coding frame reviewed by reviewers
Transferability (external validity)	Purposive sampling	A large sample size (n=203)
	Thick description	Building a digital database and reporting full data
Dependability (reliability)	Overlap methods	Various data collection methods (interview, survey, classroom observation, Moodle log, document, field note) and audio-recorded data
	Dependability audit	Entire research process carried out under supervision
Confirmability (neutrality)	Confirmability audit	Presenting preliminary findings in an international conference
	Reflexive journal	Researcher's memos

3.8   Ethical Considerations

Before conducting the research, the four teachers, together with the research supervisor, attended a meeting in which the research processes (surveys, interviews, classroom observations, Moodle implementation) were introduced. A schedule (**Appendix L**) providing more detailed information was also distributed. In the meeting, it was noted that all data collected from the teachers and students was only for research purposes, and participation was voluntary, which means they were able to withdraw their participation in the research activities at any time. Eventually, permissions from the four teachers were obtained. Besides, it was made clear to all students that the surveys and interviews would not have any effect on their in-class evaluation; also, all interviews were audio-recorded with permission, and they were informed of their rights to privacy.

Moreover, the research was carried out ethically and competently under supervision. All survey questions, interview questions, and classroom observation sheets had been checked by the supervisor in advance. In addition, to protect confidentiality, all data was kept carefully with code names and numbers. In observational research activities, Musante and DeWalt (2010) emphasize that "people have a right to know that they are the subjects of a research project" (p. 187). As stated previously, the role of the researcher in the classroom observation was overt, but the observation items were implicit for fear of affecting their behaviors in the natural setting. However, relationships with the participants were more difficult, since closer relationships might be helpful to gain trust within the community, with which the participants will be more willing to reveal their real thoughts. Musante and DeWalt (2010, p. 193) note that ethnographers should "be aware of the implications of relationships and obligations that

they incur in the field." Thus, the researcher interacted with the participants but did not actively provide suggestions to interfere in their decision on technology adoption, nor share their "gossip" (i.e., discussing how the other classes were doing).

Research findings based on the data collection and analysis methods are present in the following chapter.

Chapter 4.   Results

4.1   Pilot Study

The pilot study was conducted prior to the actual research with the same four teachers but different groups of the students and was carried out in the 2018 Fall semester. It is crucial to investigate the teaching contexts before Moodle and online materials were introduced as the teaching might change with the use of LMS. Also, the teachers' background information was collected through a survey to understand their expectations and experiences of utilizing technologies for teaching and learning purposes. The pilot surveys also played a role in testing the participants' reactions. For example, whether the participants preferred to answer a 4-point Likert scale or a 5-point scale. Besides this, a pilot survey was also distributed to the students to see if any changes were required. For example, if the students were able to understand the questions I asked. More importantly, due to time constraints in the formal classes, the pilot student survey was also administered to test the amount of time spent on it, to avoid taking up too much of the teachers' time during the main study.

4.1.1   Classroom Observation

As discussed in the literature review section, the four classes' pedagogical features can

be defined as 'teacher-centered approach' and 'low-CALL context.' The characteristics were summarized in **Table 29** according to the data collected from the classroom observations in the 2018 Fall semester.

Table 29 *The four class contexts (2018 Fall semester)*

2018 Fall	Class A1	Class B1	Class C1	Class D1
Students	20	25	22	25
Level	Intermediate	Beginner	Beginner	Beginner
Seating	U-shaped	Traditional	Traditional	Traditional
ICT Equipment	PC, projector, Wi-Fi, speaker, monitor, CD/DVD player			
Material(s) used	Textbook, printouts	Textbook, sub-textbook, self-made printouts	Textbook, sub-textbook, dictionary	Textbook, sub-textbook, printouts
Device(s) used	None	MP3 player	MP3 player	CD player, PC
LMS implementation	None	None	None	None
Smartphone banned?	Not specified	Strictly banned	Strictly banned	Not specified
Teacher's meta language(s)	Japanese	Chinese, Japanese	Japanese	Japanese
Teaching approach(es)	GTM	ALM, GTM	GTM	GTM
Content and focus	Grammar, translation	Pronunciation, grammar, translation	Pronunciation, vocabulary, grammar, translation	Vocabulary, grammar, translation, culture
Activities	Grammar instruction, translation, writing, free conversation	Drills, recitation, grammar instruction	Translation, recitation, shadowing, grammar instruction	Translation, recitation, shadowing, listening, student presentations
Interaction(s)	T-S, S-S	T-S	T-S	T-S

			Dictation test,	Dictation test,
Weekly assessment(s)	None	Dictation test	recitation	recitation
Assignment(s)	Short essay (handwriting)	None	None	None

Figure 21 *Images of classroom seating arrangement*

Traditional classroom
(Class B, Class C, Class D)

U-shaped Classroom
(Class A)
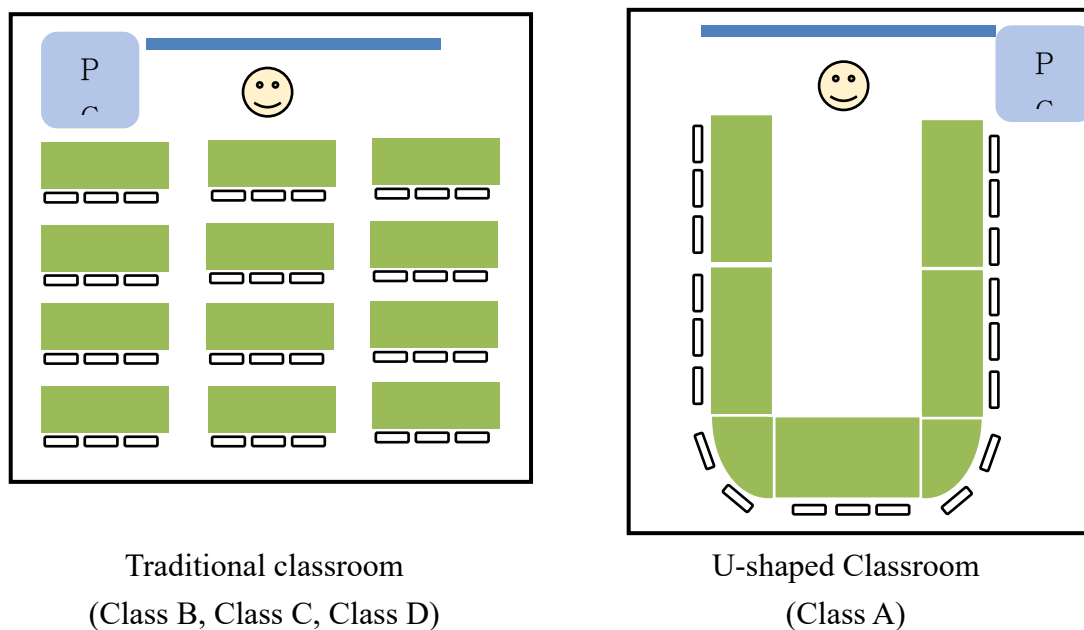
Major findings from the classroom observation are as described below:

(1) Teacher-centered approaches

Among the four classes, the four teachers taught in a traditional way in which direct instructions were applied. The teachers were the authorities who guided the teaching processes and activities. As shown in **Table 29**, most of the four classes' activities included explicit instructions and translation drills (writing and question-answer), which can be defined as a grammar translation method (GMT) with a particular emphasis on explicit grammar instruction. It was noted that Teacher B implemented both GMT and audio-lingual methods (ALM) as he adopted repetition drill and dialogue memorization in the first half of the class period, and grammar instruction taught in Japanese in the second half of the class. In Class A, Class B, and Class C, the

teachers tended to carry out routine teaching practices with the same teaching procedures and activities. The teacher-centered methods can also be determined from the classroom management, where the students passively received knowledge with a lack of pair work and group work. To evaluate the students' performance, Teacher A assigned a short essay based on a topic she selected every week. Teacher B, Teacher C, and Teacher D did not assign homework but gave a weekly quiz. The test formats varied between the classes, but they mostly consisted of a dictation test and recitation test. For example, in Class B, the teacher read the Chinese sentences adopted from the sub-material, and then the students had to write Chinese characters, pinyin, and Japanese translations. Concerning the recitation test in Class C, the teacher called the students to recite the texts and corrected their pronunciation. Also, the classroom seating (see **Figure 21** *Images of classroom seating arrangement*) in Class B, Class C, and Class D was arranged in a traditional way, meaning all the desks were facing a whiteboard and the teachers stood in the front. Although Class A was set in a u-shaped pattern, which was more comfortable for the teacher and students to interact with each other, the number of the students was quite large (n = 20), and the participants could not easily move around in the classroom.

(2) Low-CALL contexts

It was evident that though the classrooms were equipped with essential ICT devices, the four teachers rarely used it or had limited usage of it. The classroom teachings mainly relied on the use of textbooks and printouts. In Class B and Class C, the devices were merely used for playing textbooks' audio. Teacher D used a PC for playing Chinese songs and video clips on YouTube in two of the classes (17%) and used Microsoft PowerPoint in seven of the classes (58%). Teacher D used slides to present Chinese dialects and created flashcards with Japanese phrases. He asked the students to

translate the Japanese phrases to Chinese as a teaching activity. Also, by the end of the semester, he assigned the students to present a topic they were interested in. While the presentations were supposed to be given in Chinese, Teacher D allowed the students to add Japanese scripts on the slides. Teacher D also taught the students how to type in Chinese by showing them how to change keyboard settings through a PC. None of the classes were applying classroom management through the existing LMS provided by the university. The teachers relied on paper-based methods; for example, Teacher A, Teacher B, and Teacher C used a roll book, and Teacher D used self-made name cards to keep student attendance records. This can also be seen in Class A, where writing assignments were given through handwritten sheets. It should be noted that Teacher B and Teacher C banned their students from using smartphones in class. They allowed the use of an electronic dictionary but encouraged the students to bring a paper dictionary to the class.

4.1.2 Pilot Teacher Survey

The pilot survey for the teachers was given as preliminary data. Demographic data gathered from the pilot survey, interview, and documents (ePortfolio and teaching materials) indicated teachers' educational backgrounds, experience using technologies for teaching and learning, and expectancy and value.

(1) Educational background and experience

The data of the teachers' educational backgrounds is illustrated in **Table 30**.

Table 30 *Teachers' background information about teaching (n = 4) (data collected in 2018)*

	Teacher A	Teacher B	Teacher C	Teacher D

Age range	45-50	45-50	45-50	45-50
Gender	Female	Male	Male	Male
First language	Chinese	Japanese	Japanese	Japanese
Employment status	Associate Professor (without tenure)	Professor	Associate Professor	Associate Professor
Degree	PhD	PhD	PhD	PhD
Field	Chinese literature	Chinese literature	Chinese literature	Chinese literature
Teaching experience	13 years	20 years	15 years	15 years

The table above shows that the teachers had similar teaching backgrounds regarding age, education, and academia, all with a Ph.D. degree in Chinese literature.

(2) Experience of using technologies for teaching and learning

From the pilot survey, teacher device(s) ownership as well as their teaching and learning experience with the use of technology were investigated (see

Table 31). It should be noted that the term 'technology' was not explicitly defined in the survey because the teachers might have different interpretations of 'technology'- what it is and what it should be. The findings indicate that the four teachers had various digital devices. While they all had a desktop, and Teacher B had more devices, Teacher B and Teacher D still carried a flip phone instead of a smartphone at that time.

Table 31 *Teachers' experience of teaching and learning with technologies*

	Teacher A	**Teacher B**	**Teacher C**	**Teacher D**
Device ownership	Desktop, smartphone	Desktop, laptop, tablet, flip phone	Desktop, laptop, smartphone	Desktop, flip phone
Experience of	No	No	Yes	Yes

learning through technology				
What did you use for learning?	N/A	N/A	CD, video, website	Electronic dictionary, website
What did you learn with technology?	N/A	N/A	Vocabulary, listening, writing	Listening
Experience of teaching through technology	Yes	Yes	Yes	Yes
What did you use for teaching?	CD, video, email, electronic dictionary, website, X System, LMS	PowerPoint, video, website, application, X System, LMS	Video	Video, website
What did you teach with technology?	Vocabulary, grammar, listening, speaking, reading, writing	Vocabulary, grammar, listening, reading, writing	Vocabulary, listening	Vocabulary, grammar, listening

Teacher C and Teacher D responded that they had learned Chinese with technology before. However, according to their answers, the technologies they referred to seem to be 'old technologies,' such as CDs, videos, and electronic dictionaries, as they learned Chinese about 25 years ago. It is unclear what they learned through the internet. Also, Teacher D said he used to listen to the radio to learn Chinese when he was young. Similarly, Teacher C mentioned that he had learned Chinese by watching Japan Broadcasting Corporation's (NHK) television program.

The four teachers all claimed that they had teaching experience with the use of technology. Videos were found to be widely used among the teachers. Even though

Teacher A and Teacher B did not have experience using technology for learning, they had more experience with technology integration than the other two teachers. From the individual meetings, it was found that Teacher A and B were in the same department before, which adopted a Chinese learning system called X System (a pseudonym). According to Teacher A, the system was applied in computer rooms for students to learn general language skills by themselves, and the teachers monitored students' engagement in class.

The table above shows that these teachers had devised teaching and learning experiences using technology for CFL. However, Teacher C and Teacher D tended to adopt the 'old technologies' that they had used to learn with before. On the contrary, Teacher A and B did not have learning experience with technology previously, but they adopted more usage, as the X system was required to be implemented in their class by the institution they worked at before.

(3) Expectancy and value

The pilot survey also used an attitude scale to understand the four teachers' expectancy and value of technology integration in classrooms before Moodle and other online materials were introduced. The 5-point attitude survey, based on TAM and EVT, includes a total of 15 items (5 = strongly agree; 4 = agree; 3 = neither agree nor disagree; 2 = agree; 1 = strongly disagree). The interpretation of mean ranges was: 4.50-5.00 = very high; 3.50-4.49 = high; 2.50-3.49 = moderate; 1.50-2.49 = low; 1.00-1.49 = very low. As shown in **Table 32**, the items were rearranged by category, following the definitions from EVT.

Table 32 *Pilot survey on teachers' expectancy and value regarding using technology*

for CFL teaching

	A	B	C	D	M	SD
Expectancy						
Confidence						
-Confidence in digital skills (Q1)	4	4	2	3	3.25	.96
-Easy to learn ICT for teaching (Q2)	4	3	2	4	3.25	.96
Knowledge						
-Choosing appropriate online materials (Q13)	4	3	2	4	3.25	.96
-Knowing how to train students (Q15)	4	3	2	3	3.00	.82
Value						
Importance						
-Satisfied with current practices (Q7)	4	2	4	3	3.25	.96
Interest						
-Interested in teaching through ICT (Q4)	3	4	4	4	3.75	.50
Beliefs						
-Enhance student motivation (Q11)	3	4	4	3	3.50	.58
-Gain exposure to Chinese culture (Q12)	3	4	5	3	3.75	.96
Perceived Cost						
-Gaining efforts (Q6)	3	4	3	3	3.25	.50
-Lack of financial or technical support (Q8)	3	3	4	2	3.00	.82
Concerns						
-Difficult to control learning pattern (Q14)	4	4	2	2	3.00	1.15
Extrinsic Motivation						
-Useful for teaching (Q3)	4	4	5	3	4.00	.82
-Useful for classroom management (Q5)	3	4	4	3	3.50	.58
Social Motivation						
-Lack of discussion with colleagues (Q9)	2	3	5	4	3.50	1.29
-Perceived students' interest (Q10)	4	4	4	3	3.75	.50

The major findings are described below:

(1) Generally neutral attitudes

The data above indicates that the four teachers generally had moderate attitudes, as they tended to choose the range between 2 (disagree) to 4 (agree). From the mean ratings, it can be seen that seven of the items were rated as high agreement, which are in the categories of *Interest* (M = 3.75), *Beliefs* (M = 3.50 and 3.75), *Extrinsic Motivation* (M

= 4.00 and 3.50), and *Social Motivation* (M = 3.50 and 3.75). Under the category of

E*xtrinsic Motivation,* the item 'perceived usefulness for teaching' got the highest mean

rating (M = 4.00). On the other hand, the items 'knowing how to train students' (M =

3.00), 'lack of financial or technical support' (M = 3.00), and 'difficult to control

learning pattern' (M = 3.00) got the lowest mean ratings. Results in SD also show that

the teachers' opinions on 'lack of discussion with colleagues' is the most dispersed (SD

= 1.29), though they were in the same department.

(2) Teacher A

Teacher A reported relatively higher scores on *Confidence* and *Knowledge* compared

with the other teachers. From the four items (Q1, Q2, Q13, Q15), it can be found that

Teacher A was more confident in her digital skills and perceived it was easy for her to

learn how to teach with technology. At the same time, she showed less *Interest* in

teaching through technology (Q4) and had more concerns about technology integration

as it might be difficult to control students' learning pattern (Q14). Also, Teacher A

perceived less *Importance* of technology use in her teaching because she was satisfied

with the current teaching practices (Q7), and she thought the technology-related sharing,

discussion, and support among colleagues were enough (Q9).

(3) Teacher B

From the item regarding *Confidence* in digital skills, it can be seen that Teacher B rated

highly in *Confidence* (Q1) as Teacher A. However, Teacher B disagreed that he was

satisfied with his current teaching methods (Q7). Though he generally had positive

attitudes toward using technologies for teaching and learning, he agreed on the items

that revealed the *Perceived Cost*. Teacher B thought that using technology for teaching

would add to his workload (Q6). Like Teacher A, he was apprehensive about the

difficulties of controlling students' learning patterns through technology (Q14).

(4) Teacher C

Based on the results, on the one hand Teacher C had relatively positive attitudes toward integrating technology in his teaching, which can be seen from the items of *Interest* (Q4) and *Beliefs* (Q11, Q12). He particularly believed that his students were able to access Chinese language and culture with the use of technology (Q12). Also, he rated the highest score on *Usefulness* (Q3) as he strongly agreed that technologies were useful in his teaching. Whereas Teacher A and Teacher B worried that using technologies would make it difficult to control students' learning (Q14), Teacher C was not concerned about this.

On the other hand, Teacher C revealed more negative attitudes compared with the other teachers. As reported, he had less *Confidence* and *Knowledge* of technology. It was stated that he was not confident in his digital skills (Q1), and he did not think it was easy for him to learn new technologies for teaching (Q2). Selecting appropriate online materials for CFL teaching and learning (Q13) and training students to use (Q15) might be difficult for him as he rated the lowest scores. It seems he was satisfied with the current teaching practices (Q7) without using technology in the classroom, so he did not perceive it as necessary. Finally, though the four teachers were in the same department, Teacher C revealed a lack of financial and technical support from the institution (Q8) and a lack of discussion and sharing information about teaching through technology among the teachers (Q9).

(5) Teacher D

It was found that Teacher D moderately rated more items (9 out of 15 items) on "neither agree nor disagree," which indicated that he did not have specific ideas about technology use for CFL pedagogy. Relatively, he rated higher scores on *Confidence* and *Knowledge* as he thought it was easy for him to learn technology for teaching purposes (Q2), and he knew how to choose appropriate online materials for students (Q13). Teacher D also revealed his *Interest* in teaching through technology (Q4). Having an opposite opinion with Teacher C, Teacher D disagreed that there was a lack of financial or technical support (Q8). Meanwhile, he was not worried that he would lose control of teaching with the use of technology (Q14).

4.1.3 Pilot Student Survey

A pilot survey was conducted to investigate the student participants' (N = 92) background information; particularly, to understand their experiences and motivations for learning Chinese with the use of technology. This can be divided into two sections: (1) background information and motivations for learning Chinese, and (2) experiences and expectation of learning Chinese with technology.

(1) Background information and motivations for learning Chinese

As mentioned in **Chapter 3**, the students in Class A1 were at an intermediate level and had been learning Chinese since high school. From the pilot survey, **Table 33** shows that the A1 students had 4.8 years of learning experience, while the students in Class B1, Class C1, and Class D2 had been learning for more than six months. Some of the students might learn Chinese in their high school; for example, two of the students in Class B1 responded that they had learned Chinese for one year in high school.

Table 33 *Experience of learning Chinese (n = 92)*

Class	Class A1	Class B1	Class C1	Class D1
n	20	25	22	25
Months	58.80	6.80	6.18	6.04

Following the Self-Determination Theory (Ryan & Deci, 2000), the students' motivations for learning Chinese were categorized as *Intrinsic Motivation*, *Extrinsic Motivation*, and *Amotivation.* It can be noted that the majority of the students (82%) chose Chinese as their foreign language subject because of extrinsic motivation (see **Table 34**), which was for instrumental reasons such as perceived usefulness and benefits. The students regarded Chinese as useful, and which might be widely used in their future for getting a job, as they thought it was the most spoken language in the world other than English. Meanwhile, a total of 11 students (12%) also thought Chinese is easy to learn since it shares the same characters with Japanese Kanji. This can be identified as *Perceived Cost* according to Expectancy-Value Theory as well.

Table 34 *Motivations for choosing Chinese courses*

Reasons	A1	B1	C1	D1	T
Intrinsic (T = 13)					
I am a native speaker	2	0	0	0	2
It looks interesting	1	1	0	2	4
I want to learn about CH culture/literature	1	2	3	1	7
Extrinsic (T=75)					
I can use CH in my future	4	7	3	4	18
To get a better job	0	1	1	1	3
China's economic boom	2	0	1	1	4
A large population of CH speakers	1	7	0	5	13
I want to travel to CH speaking countries	0	1	1	1	3
China–Japan relations	1	4	6	3	14
Easy to learn	5	1	1	4	11
Family's suggestion	1	0	1	0	2
Friends'/seniors' recommendation	0	1	2	2	5

Not interested in the other languages	1	0	1	0	2
Amotivation (T = 1)					
No ideas	1	0	2	0	1
Others (T = 1)					
No response	0	0	0	1	1

When asking what their goals for learning Chinese were, 54 out of 92 students (58.7%) claimed that they would like to achieve "basic communication skills in Chinese," but it is not clear how "basic" or in what contexts. A total of ten students (10.8%) specified a context of travelling to Chinese speaking countries (i.e., Taiwan). Although the students were all in law school, only one of them intended to learn Chinese related to their major. It was noted that this was an open-ended question, and while all the students at the beginner level had somewhat clear goals, two of the students at intermediate levels had no ideas about their learning goals.

Table 35 *Goals for learning Chinese*

Goals	A1	B1	C1	D1	Total
To be able to communicate in CH	7	16	16	15	54
To be able to travel to CH speaking countries	1	2	2	4	10
To be able to read CH	1	0	1	3	5
To be able to listen CH	0	1	0	2	3
To understand CH laws	0	1	0	0	1
Do not forget in the future	2	0	0	1	3
To pass HSK or other certificate exams	2	0	1	0	3
To get academic credit	2	2	1	0	5
Other goals	3	2	1	0	6
No ideas	2	0	0	0	2

To provide online materials that might arouse the students' curiosity, the language aspects they were interested to learn were investigated. **Table 36** demonstrates that a

majority of the students (66.3%) claimed they wanted to learn communication, followed by content about travelling (46.7%) and pronunciation (28.3%). Besides this, a total of 62 students (67.4%) were interested in Chinese history, literature, ancient culture, along with pop culture. This preliminary data was taken as references to prepare for the online materials in Moodle.

Table 36 *What specific language aspects do you want to learn?*

Subjects	A1	B1	C1	D1	Total
Pronunciation	8	10	4	4	26
Communication	13	19	17	12	61
Reading	7	6	4	4	21
Certificate exam	6	0	3	2	11
Learning strategy	2	3	3	4	12
News	5	7	3	6	21
History	3	6	5	8	22
Literature	1	2	3	3	9
Ancient culture	3	3	5	4	15
Pop culture	2	3	5	6	16
Travelling	8	10	10	15	43
Others	1	0	0	1	2
Nothing	0	1	0	0	1

(2) Experience and expectation of learning Chinese with technology

This section preset the student participants' (N = 92) experiences and intentions of learning Chinese with technology. Similar to the teacher's pilot survey, the term "technology" was not defined specifically because the students might have different definitions for it.

Since a lack of digital devices might be the main barrier to engage in online tasks, the student participants were asked about their device ownership. **Table 37** shows that

while the vast majority of the students own a device (96%), some of them still did not

have a smartphone, and one had a flip phone. Furthermore, the results also revealed that

not every student owned a desktop (12%) or a laptop (90%) computer.

Table 37 *What devices do you have? (multiple selections possible) (n = 92)*

Device(s)	A1	B1	C1	D1	Total
Desktop	5	2	2	2	11 (12%)
Laptop	16	24	20	22	82 (90%)
Tablet	5	9	4	1	19 (21%)
Smartphone	19	25	22	22	88 (96%)
Flip phone	0	0	0	1	1 (1%)

The results from **Table 38** reveal that the percentage of the students in the four classes

who had not learned Chinese with technology before was quite high, with a total of

62% of the students, and especially in Class B1, with 84%. The percentage in Class A1

and Class C1 of the students who had learned Chinese with technology was 50%, while

50% had not.

Table 38 *Experience of learning Chinese with technology (N = 92)*

	A1	B1	C1	D1	Total
No	10	21	11	15	57
Yes	10	4	11	10	35

When asking the students more specifically what "technology" they used to learn with,

the majority of the responses were CD (34%), electronic dictionary (26%), and websites

(20%). While the websites they referred to were unclear, one of the students in Class

A1 indicated an online dictionary website, and one student in Class B1 referred to

YouTube's website in the open-ended question. Also, one of the students in Class C1

who answered "others" noted that she used her smartphone for audio recording.

Table 39 *What methods did you use for learning foreign languages?*

Materials/tools	A1	B1	C1	D1	Total
PowerPoint	1	0	0	0	1
CD	4	1	10	6	21
Video	2	0	0	0	2
Email	0	0	0	0	0
Electronic dictionary	8	1	5	2	16
Software	0	0	0	0	0
Web	5	1	3	3	12
App	4	2	1	0	7
Others	0	1	1	0	2

Regarding the previous question, the students were asked what language aspects and skills they learned with the "technology" mentioned above. Most of the students responded with vocabulary (35%), listening (32%), grammar (14%), and speaking (12%), showing that the students tended to use CDs, electronic dictionaries, and websites to learn vocabulary and listening.

Table 40 *What language aspects did you learn with the technologies you chose above?*

Aspects	A1	B1	C1	D1	Total
Vocabulary	9	3	8	3	23
Grammar	5	1	2	1	9
Listening	5	2	8	6	21
Speaking	2	2	1	3	8
Reading	0	1	0	1	2
Writing	2	0	0	0	2
Others	0	0	0	0	0

Since the teachers' pilot survey was carried out before the students,' it was found that

the teachers tended to give a neutral response on a 5-point Likert scale. Thus, it was revised to a 4-point Likert scale (4 = strongly agree; 3 = agree; 2 = agree; 1 = strongly disagree) to force the participants to choose a specific answer. **Table 41** shows that most of the students agreed that they were interested in learning Chinese with the use of technology (M = 3.02), and they were willing to use SNS to communicate with their teacher after class (M = 2.78). However, their knowledge of using online materials and tools for learning purposes varied, particularly in Class B1 and Class D1, which had relatively lower confidence than Class A1 and Class C1. This is likely why the students relied more on the teachers to provide appropriate online materials.

Table 41 *Students' attitudes toward learning through technology (mean)*

(Cronbach's Alpha = 0.853) (N = 92)	A1	B1	C1	D1	M
I am interested in learning Chinese with technology	3.00	3.04	3.05	3.00	3.02
I know how to choose appropriate online learning materials	2.70	2.08	2.68	2.24	2.40
I know how to use online tools for learning	2.60	2.16	2.68	2.36	2.43
I hope the teacher can provide appropriate online materials for me	3.00	3.12	3.05	3.16	3.09
I want to communicate with the teacher through SNS/LMS after class	3.00	2.80	2.59	2.76	2.78

4.2 Teachers' Perceptions

4.2.1 A Workshop, Meetings, and Emails

Formal and informal interviews were conducted in this current study. In this section, data was collected from the unstructured interviews, which were carried out without predetermined questions. The data was gathered from the field notes taken in a workshop and several individual meetings with the teachers. During the training sections, the researcher recorded the teachers' opinions on the online materials and

Moodle and observed their digital skills and emotions relating to receiving the training. In addition to this, emails between the researcher and the teachers were also collected and analyzed to see if they highlighted a requirement for any online materials or technical support.

Table 42 *Frequency of workshops, meetings, and emails with the teachers (across the semesters)*

	Teacher A	Teacher B	Teacher C	Teacher D
Workshops	0	0	1	1
Meetings	1	1	0	4
Emails	6	1	6	46

Workshop

A workshop was hosted in a computer room to introduce Moodle and to demonstrate its practical usage with some teaching examples. The introduction took one and a half hours, and the procedures were broken down into four steps: (1) setting up; (2) a brief introduction of the Moodle functions; (3) a demonstration course with the use of Moodle, and (4) discussion and Q&A. Teacher A and Teacher B were absent due to personal reasons; thus, the workshop was only held with Teacher C and Teacher D, but the procedures were the same.

For the first step, the teachers were asked to log into Moodle with the accounts the researcher created for them, and to change the passwords automatically generated. At the same time, some difficulties were identified during the setting up. For example, Teacher C arrived earlier, but he forgot his password to login to the desktop computer, so he returned to his office to check it. After logging in to the computer, Teacher C and Teacher D could not find a browser, and they were hesitant to type the URL address of

the Moodle site. The researcher noticed that Teacher C typed slowly with his two index fingers, and Teacher D typed the website address in the Google search box but accidentally closed the web browser several times. This is probably because they did know how to do it or were not familiar with the computer. To change the password, the researcher asked the two teachers to find the registration confirmation email, but they did not know how to find the email by typing a keyword into the search box in Gmail. Difficulties could also be found after logging into Moodle. For example, Teacher C and Teacher D spent a long time resetting their new passwords. Teacher D further complained the password policy was "*annoying*" in requiring a minimum length of eight digits, including at least an uppercase and lowercase alphabetical letter, and a non-alphanumeric character. Teacher D wrote down his new password on a piece of paper to remember it. The results from the first section might indicate a lack of basic digital skills from observing Teacher C's and Teacher D's reactions.

In the second section, the researcher introduced various functions and possible usages of Moodle and emphasized the differences from the existing LMS (i.e., students can evaluate each other's work through Moodle, using a mobile version of the application). Also, the contexts of using Moodle were explored. For instance, due to the formal courses' time constraints, some tasks and learning materials could be distributed through Moodle outside of class, and the teachers could check students' engagement with the system. The researcher also told the teachers that the university planned to use Moodle in the near future. When introducing each feature (e.g., forum, chatroom, wikis, file sharing), Teacher C asked what the difference between "chatroom" and "forum" was, where the former is synchronous and the latter asynchronous. In addition, when introducing wikis, the researcher asked if the two teachers had used it before and knew how it worked, but neither of them knew.

The teachers' concerns about the contents of online materials can be found in the following section. In the third section of the introduction process, a demonstration class with Moodle's features and various online tools was presented. The researcher showed the teachers some task-based learning activities, for example, a discussion forum with a YouTube link, asking students to watch a video clip and answer the given questions, a project to make an animation with Chinese scripts to create a self-introduction using Vyond (an online animation tool), and so on. However, Teacher C raised a concern about students' effort and the difficulty of evaluation he perceived:

> *I am not sure if the students will be interested in engaging in these activities.*
> *They may be a burden on them.*
>
> (Teacher C)

Teacher C also said that Teacher B assigned the students interviews in Chinese previously. However, because of the recent increase in student numbers, it became challenging to evaluate the activity. Since there were many students in each group, some worked harder while some did nothing. Teacher C claimed that they had received this complaint from the students before.

The teachers' concerns about the content could also be seen when the researcher presented authentic materials (e.g., YouTube video clips and online listening materials) to the teachers. One of the videos was about Chinese foods, which was spoken in Mandarin Chinese and other dialects. However, Teacher C thought the materials might be confusing to the beginners, who had "*a lack of vocabulary knowledge*" and said "*the materials are more suitable for intermediate learners but can be used as supplemental*

materials." He also emphasized that "*students should learn standard Chinese*". The researcher had explained that it was merely an example to show how a YouTube link can be inserted in Moodle, and the video was based on the textbook topics that Teacher C and Teacher D had mentioned in their classes.

In the final section, the participants were encouraged to discuss the two questions I raised; however, the two teachers did not "discuss" with each other but replied to me directly. The questions I intended to let them discuss were (1) "*What functions do you plan to use?*" and (2) "*By using Moodle, what kind of activities can be done outside of the classroom?*" Teacher C suggested uploading some materials related to Chinese and Japanese news and law, but he did not clarify which functions or features of Moodle he preferred. He also stated that "*the in-class and out-of-class materials should be separated because the students had assignments from other classes.*"

The researcher provided a system to the teachers previously, which was a story-based application for self-regulated learning. Thus, Teacher C said:

> *The previous system is better [than Moodle]. Is it still available? They [the students] can use it when they want. If they have too many activities to do, they may hate learning Chinese. I have a student who dropped the class in the middle of the semester. He might find himself fallen behind the class.*
>
> (Teacher C)

Compared with Teacher C, Teacher D did not express his opinions but mostly showed agreement with Teacher C by saying "*I agree with him.*" At the end of the workshop, Teacher D read the Moodle manual I distributed and asked the researcher "*Why are you*

so good at Japanese writing? Did you recite it?" This shows that Teacher C's interests in using Moodle were determined by the contents he perceived to be less effort for the students, and the teacher ecology with a lack of discussion but rather showing agreement with others.

Meeting with Teacher A

Teacher A did not attend the workshop for training with Moodle because she was sick. Therefore, the researcher arranged an individual meeting with her to train her in the same contents from the workshop. In the meeting, compared with Teacher C and Teacher D, Teacher A seemed to be more confident with her digital skills, and no particular difficulties were found in the first two introductory sections.

Though the researcher demonstrated the functions in using Moodle, Teacher A focused more on the contents. Similar to Teacher C, she stated that students should learn "*standard pronunciation.*" Teacher A said that she was from the southern region of China, so she had been making an effort in her pronunciation to prevent dialect interference in the class. She said she did not correct her students' "*Taiwanese accent,*" but she encouraged her students to "*go abroad to study in Beijing at the beginner level, then go to Taiwan or Shanghai later.*"

A karaoke task through Moodle was also presented. Same as Teacher C, though it was merely an example of the use of Moodle's features, Teacher A expressed concerns about the content, rather than the features. Teacher A said the girls at another university might like the karaoke task, and she had played a Taiwanese drama in the class before; however, she thought only the students who were interested in Taiwanese culture would do the task. Also, Teacher A noted that the students at this university did not have strong

motivation because "*they have other more important things to do*" (e.g., study for vocational qualifications). She claimed that was the reason why she allowed her students to read extra-curricular books and do examination questions during class time.

In the Q&A section, when asked which of Moodle's functions the teacher planned to use, Teacher A stated "*It may be a good idea to use videos. Students can not only listen to Chinese but also see the scenes in China*", and she asked the researcher how to find the pictures and videos, which were available on Google and YouTube. The lack of knowledge of searching for information on the Internet can also be identified by the question: "*How do you find online journal articles in Taiwan?*" When I showed Teacher A a thesis search engine in Taiwan and Google Scholar, she said she did not know Google Scholar, so she had always bought books from China through a bookstore.

In the individual meeting, Teacher A revealed her negative experience of CALL, with which the X System was used. She argued that she was not satisfied with the system, which threatened her role as a teacher:

> *I feel alone when seeing the students actively engaging in the system in the classroom. The only thing I was doing is walking around and waiting for them to ask me a question.*

(Teacher A)

Teacher A claimed that most of the students were busy doing the tasks, so they rarely asked a question. She said some teachers thought it was easy to teach with the system because they did not have to "*teach*". She also noted that Teacher C did not like teaching with computers as he preferred teaching face-to-face. Furthermore, she claimed the

teachers in the previous department did not like the system. Their superior requested them to use it; thus, "*we (the teachers) won't say anything.*" This shows not only concerns about the content but also previous experience, along with social motivation, that influenced Teacher A's use of technology. In terms of social motivation, the "teacher ecology" will be further discussed in the next chapter.

Meeting with Teacher B

Since Teacher B did not attend the workshop, the same introduction was given to him individually. In the setup and introduction section, Teacher B did not make much effort to follow. Teacher B claimed that he had heard about Moodle before, but he had never had a chance to try it. In the demonstration section, the researcher presented a sample of an interview task asking students to go to a Chinese restaurant and speak Chinese following the task guidance. Teacher B said that he had done a similar task before, which was to interview Chinese students on the campus. It seems that he did not rule out task-based language teaching (TBLT). Teacher B also showed a positive attitude toward Moodle, as he said that "*It would be ideal if the formal class can combine with Moodle.*" However, simultaneously, he argued that "*Teachers have to spend too much time doing it.*" When asked which Moodle features were likely to be used, Teacher B responded that he might try "Assignment" and "Quiz" in Moodle, but again, he was concerned that "*it might take time to design [the activities]*," thus he claimed he preferred "Reference," "File," and "Folder" which "*might take less time.*"

Having had the same experiences as Teacher A, Teacher B also had a negative experience of using the X System in their previous department. According to Teacher B, he was a research assistant involved with developing the system, following his superior's instruction to do whatever he was asked to do at that time. He was in charge

of the contents, and the technological aspects were managed by the science and engineering institution they cooperated with. However, he did not seem to enjoy teaching with the system that he thought meant "*teachers become simply a manager.*" Although he had participated in developing a CALL system before, he seemed to have a negative experience of teaching with it. Teacher B also showed the researcher his thesis on the system. The article shows that the system had been developed nearly 20 years ago, with designed drills and translation practices. Thus, the researcher emphasized that Moodle is different from X System, in that teachers can adjust the content anytime, and students can interact with each other via Moodle.

The researcher also observed that Teacher B seemed to have better digital skills than the other teachers, as he had a large PC screen and a tablet in his office and had no specific difficulties in the training section. Also, Teacher B seemed interested in trying new technology; however, he did not want to spend too much effort as he claimed, "*I am too busy.*"

Meetings with Teacher D

Aside from the workshop for training on using Moodle, Teacher D requested four individual meetings, mainly for teaching consultations. In the meetings, Teacher D talked about his teaching beliefs; for example, he claimed that he preferred to provide language output for the learner first, which might be different from the other teachers who tended to provide input first. He also mentioned how he selected the textbook, as he was willing to try a new textbook. The layout of the content might be an important consideration for Teacher D since he pointed out the figures, format design, and how pinyin was placed in the textbook. He claimed that the textbooks were likely to place pinyin and tone above characters. However, the students tended to rely on the glossed

pinyin, which was why he preferred the digitized textbook in Moodle, which separated the text and pinyin. In addition, Teacher D revealed his concerns about providing feedback on students' writing tasks in Moodle. He asked the researcher to help check the writings that he had corrected as he claimed that "*I am not a native (of China).*" He seemed not to be confident with his language skills, though the researcher did not find anything to be changed in his corrections. Teacher D also said that he spent a lot of time evaluating the tasks. However, as a home teacher, he was able to learn more about the students from their writing tasks, as he also provided students with educational guidance and counselling.

Emails

The emails back and forth between the teachers and the researcher were collected to see if the teachers had any technical difficulties or requests for support. The majority of the emails were related to arranging meetings (24 emails), announcing class cancellations (four emails), greetings (three emails), and acknowledgements (seven emails) with the four teachers. Aside from these, only Teacher D sent emails requesting teaching and technical support. It was found that Teacher D asked the researcher to upload materials to Moodle, with a total of seven emails with requests for this. Also, as mentioned above, Teacher D seemed to be aware of his limited language skills, so he sent students' texts and files to the researcher to ask if they could be double-checked for him. There was also an email sent to provide Teacher D with technical support. Teacher D assigned a task, which asked the students to read a text and record their voices, but he found difficulties in opening the various file formats (wav, m4a, etc.) with his PC. Thus, the researcher converted the files to MP3 format and sent them to Teacher D by email.

4.2.2   Teacher Interviews and Short Talks

Since it was found that the teachers tended not to express their own thoughts in the group (e.g., in the workshop), the individual interviews were conducted at the end of the 2019 Fall semester to make them comfortable in revealing their thoughts. The data collected from the in-depth semi-unstructured interviews, as well as the short talks (see **Table 43**) with each teacher after the classroom observations (about five minutes each time), are analyzed in this subchapter. It is noted that some of the interview questions had been answered in the short talks. Therefore, the interview questions for each teacher were slightly different and did not strictly follow the question list. The teachers' responses in the interviews were merged with the short talks and are summarized in the following themes with significant extracts.

Table 43 *Short talks with the teachers across the three semesters*

Short Talk	Teacher A	Teacher B	Teacher C	Teacher D
Frequency	18	20	8	27

(1) Technology use in daily life and teaching

In the interview, the teachers were asked about their uses of technology in daily life and at work. The teachers generally used PCs to write emails, research articles and fill out the score sheets rather than use them in the classroom. Some of the teachers had experience of using the existing LMS but had limited usage for various reasons. Teacher A mentioned that she had a WeChat (a messaging application widely used in China) group with another class. The researcher asked why the teacher chose WeChat rather than Line (a messaging application widely used in Japan), which almost every Japanese university student uses. Teacher A replied:

I don't use Line. I use WeChat…If the students are not motivated, then even if I use Line, they will not use it. If the students are motivated, they will follow me to use WeChat…This class [Class A] is not motivated, so I don't use it [WeChat] with them.

(Teacher A)

The researcher asked the teachers further about their experience with using the existing LMS. It seems that Teacher A adjusted her use of SNS and LMS according to students' motivation and the class size. She said:

I use the existing LMS, but not every time, only when announcing something or providing additional assignments. I also upload additional materials for the students who have individual demands or who fall behind in the course, but not for this class…Because they are not motivated…I don't use it [the LMS] for calling the roll because the class size is small. It's inconvenient to bring my PC to the classroom.

(Teacher A)

The functions I have used so far are…For example, delivering audio materials and printouts. I know there are some functions like taking an online quiz, but I haven't tried them yet.

(Teacher B)

I don't know how to use the existing LMS and Moodle very well. And I don't have time to use it in class, as you see that I use textbooks and sub-textbooks in class.

(Teacher C)

Since the existing LMS also has the function of tracking a user's usage pattern, Teacher B noticed that he checked students' engagement sometimes and found that the students who put efforts into listening to the audios do have better performance:

The students who study very hard do listen to the audios many times…On the contrary, the students who are not motivated don't even open up the LMS…When I was instructing pronunciation in class, the students who understood immediately were the ones who had listened to the online audios.

(Teacher B)

As can be seen from the extracts, the teachers exhibited limited usage of technology; particularly for Chinese teaching purposes. Except for the fact that the institution required the teachers to grade students' scores through the existing LMS, the teachers mainly used it for announcing class cancellation information and occasionally distributing teaching materials. This might be due to (1) perceived cost and students' motivation (i.e., Teacher A); (2) work priority (i.e., Teacher B), and (3) a lack of knowledge of the usages and a preference for paper-based materials (i.e., Teacher D).

(2) Banning devices in class

The teachers were asked "*Do you ban technology use (smartphone, laptop, tablet, Smartwatch, electronic dictionary) in class? Why or why not?*" The teachers' responses varied regarding device usage in the classroom and expressed their concerns about the usage. It was also found that an electronic dictionary was particularly acceptable, although they encouraged the students to bring a printed dictionary to the class.

They use laptops and smartphones to look up words…I can't force them to buy a dictionary. I can't monitor what they are actually doing [with smartphones and laptops]… But I can tell if they are using translation functions by marking their writing tasks.

(Teacher A)

In the past, if we didn't have a dictionary, we didn't know how to pronounce the words. It [a dictionary] is necessary…I don't mind the students using a smartphone to look up words in class, but the class becomes out of order. One of the interesting things to come to the class is to get together…And feel "the sense of unity".

(Teacher B)

I ban smartphones in the classroom, but the students can use smartphones at home for self-learning…There is no need and no time for them to use smartphones and laptops in my class, but it's ok to use a printed dictionary and electronic dictionary in class…Because smartphone-based dictionaries have fewer vocabulary items and sample sentences compared with paper-based dictionaries.

(Teacher C)

According to how the teachers responded, their educational beliefs on classroom practices were the main factors deciding the acceptance or banning of devices. The teachers seemed to allow electronic dictionaries in class rather than smartphones, though students can use online dictionaries through smartphones. Their reasons varied,

as Teacher B believed using a smartphone may damage "*a sense of unity*" within the class, and Teacher C believed online dictionaries contain fewer contents than the printed one. Overall, the teachers seemed to prefer paper-based materials used in class as they encouraged the students to carry a dictionary, which was how they had learned.

(3) Teacher training and support

The teachers were asked if they had received training on teaching and using technology before, and what they would do if they encountered teaching problems and technical difficulties. It was found that the teachers had not received training on teaching, so they seemed to teach the ways they were taught, and they seemed to have a lack of discussion of teaching and sharing teaching ideas with each other.

> *I didn't receive any training. I think every teacher is the same. We all teach from our classroom experience…We are colleagues, so we don't propose working methods. Should we say anything? No, we don't. We can't…At least these teachers don't communicate with one another about teaching methods.*
>
> (Teacher A)

Also, the teachers seemed to have received insufficient training on using the LMS from the university. Depending on their employment status, the teachers received different information about the LMS. It seems that the full-time teachers with tenure had meetings frequently compared with the teachers without tenure; thus, the teachers' responses varied as follows:

> *I haven't heard that [the university will adopt Moodle next semester]…The promotion is insufficient. We don't all know about the information.*

(Teacher A)

I got the announcement that there are several training sessions on Moodle usage. They [the university] tells us to attend, but to be honest, I am busy, so I haven't attended yet.

(Teacher B)

[The staff from] the university introduced Moodle in the meetings and distributed a manual…I know how to use the basic functions, but I am still not familiar with it.

(Teacher C)

Regarding support, instead of attending training sessions provided by the university, the teachers tended to require support from the university only when they encountered technical difficulties.

When I have urgent technical problems, it is faster to call them [the technical support centre in the university] for help than figure it out by myself…But they can't interfere in teaching. It is difficult if they don't have professional knowledge. It is not that they don't, but the teachers refuse them.

(Teacher A)

Also, the non-native teachers seemed to need more support from native speakers, as Teacher B said:

We have an Assistant Language Teacher (ALT) in high school now, who

supports the Japanese teachers. My kids are learning English as a compulsory course in primary school, which is taught by Filipino teachers. It is nice if the university can do so [employ an ALT]...Because Chinese native teachers have better pronunciation [than non-native teachers].

(Teacher B)

As has been mentioned above, the teachers received insufficient training in teaching and in educational technology utilization. The lack of knowledge might play an essential role in adopting technology for the LMS. However, it is not that the university did not provide the training, but simply that the teachers did not obtain the information or did not attend. This shows that the obligatory training sections might not facilitate the teachers' motivation. Moreover, the "hierarchy" among the teacher ecology might exacerbate the imbalance of information, as different employment statuses might receive different information, and the junior teachers were not encouraged to speak out in front of their seniors. When encountering teaching problems, they tended to solve them by themselves rather than ask their colleagues for help, which is likely because of the lack of communication about pedagogy among these teachers. Instead of finding teaching support, the teachers tended to rely on the technical support team established by the university when encountering technical difficulties. Additionally, it was found that the non-native teachers might need teaching support that differed from the native speakers according to their awareness of "standard language".

(4) Teaching philosophy
Although the teachers did not receive training on Chinese language teaching, they seemed to have their own teaching philosophies in terms of beliefs about teaching and learning. From the teachers' interviews, it was found that their teaching philosophy was

related to institutional policies and their perceived students' motivation.

> *The students have high learning aptitudes, so if they want to study harder, they'll find many methods by themselves or ask teachers. Teachers should not interfere too much but provide help when needed…The students have their own goals. That is, they know what they want to do in the future and choose the courses according to their needs. However, the university requires them to get the credits, though they don't want to choose this course…I know English is more important for them. As a teacher, I can't force them. We can only provide them with knowledge but not constrain them or force them. So, they do not desire to study but think that what they have done is sufficient.*
>
> (Teacher A)

> *The first year of Chinese learning is to let the students experience the language. It is important to learn a language...I want to try many kinds of teaching methods…The contents [self-made printouts] are original, but the methods [ALT] are from my previous Chinese learning experience.*
>
> (Teacher B)

> *Since foreign language courses are compulsory, the students have to take the course at least for two years. They have many examinations on their major in their third and fourth year. Thus, the majority of the students end their learning after the beginning to intermediate levels. Therefore, teaching them the basic language skills makes it easier to study the language after they graduate…Chinese language teaching is to make the students build their studying habits.*

(Teacher C)

The responses above show how the teachers viewed their role in teaching Chinese as a foreign language. It seems that the teachers perceived their students as having a lack of motivation for learning Chinese, and they knew most of the students took the course simply to get the required credits rather than to acquire the language. This perceived low motivation might affect how much effort the teachers decided to put into their teaching at the same time. In other words, their teaching philosophy in terms of values, goals, beliefs regarding teaching and learning might form their teaching practices, which may then further affect their implementation of technology for teaching.

(4) Needs and concerns about online materials

After the classroom observations, the researcher asked the teachers if they requested any online materials to be uploaded to Moodle. The teachers' responses varied according to their teaching philosophy. That is, what they wanted to do online was grounded in the beliefs that they perceived as important to teach, which were based on their existing teaching approaches. For example, Teacher A did not have specific ideas about what to do with Moodle, so she suggested digitalizing the textbook and uploading the CD. She stated, "*They can read the stuff through the system at home and discuss it in class.*" Since Class A2 was for intermediate students who had learned Chinese for five years, the researcher suggested student-centered learning through Moodle.

> **Researcher:** *What do you think about the idea of letting the high-level students find online materials by themselves for peer learning?*
>
> **Teacher A:** *Don't make them do extra work. They have vocational qualification examinations.*

Researcher: *Is there anything that you want me to put in Moodle?*

Teacher B: *It would be ideal if you can show the students what modern China looks like.*

Before the summer break, the researcher asked Teacher B again if he needed additional materials to be uploaded to Moodle so that the students could review during the period.

Teacher B: *The practice of Chinese tones. The material we are using now is related to university contexts, so I hope they can understand how the language is used in practice with scenes.*

Researcher: *Do you mean like a drama or TV program?*

Teacher B: *Yes, like an interview program called "鲁豫有约 (Lu-Yu You Yue, a Chinese television talk show)" and how 福原爱 (Fukuhara-Ai, a Japanese table tennis player who is fluent in Mandarin Chinese) speaks Chinese, though she has a northeastern Chinese accent.*

Although Teacher C resisted his class being observed in the 2019 Fall semester, thereby reducing the opportunity for short talks, the researcher found the time to communicate with him. After one of the informal pronunciation classes, the researcher showed Quizlet (through Moodle) to the teacher and asked if he had any requests. The responses were extracted as follows:

It [Quizlet] looks helpful. I'll introduce it to the class, so that they can review [the vocabularies] during their summer vacation…Is it possible to have an online quiz in substitution drills [through Moodle]? For example, I'm a teacher. I'm a student. I'm a lawyer.

(Teacher C)

As can be seen, the teachers preferred using Moodle and the online materials for out-of-class learning, in particular reviewing textbook-related materials and watching videos to learn Chinese culture and pronunciation according to their teaching beliefs. It was also noted that the teachers seemed to have similar concerns about the online materials. For instance, Teacher A and Teacher C wondered if digitalizing the textbooks through Moodle would infringe copyrights. Teacher D also worried, saying "*Is it all right to upload NHK videos on Moodle? What about copyright?*" It is likely that because the teachers were taught in law school, they were aware of the copyrights of the online materials. In addition, the teachers also expressed their concerns about the contents according to their beliefs of Chinese language teaching.

Just as Teacher C had stated that the students were unable to learn tones through Chinese songs in the training section, Teacher D revealed the same concerns in the interview. Although the researcher noted that they still can learn vocabulary and grammar from lyrics, Teacher D seemed not to agree with this as he doubted it, saying "*Are the lyrics grammatical?*"

The extracts above indicate that the teachers seemed to have vague ideas about what online materials should be provided; however, they resisted suggestions from the researcher. It is likely that the teachers viewed online materials as a learning supplement for the students, rather than for formal learning. Besides this, most of the teachers tended to hold conservative thoughts on SLA, as they held a belief in "standard language" and did not encourage the use of authentic materials; but while Teacher B was opened to authentic materials, he was concerned about the accent spoken in the

videos.

(6) Expectations and reflections on Moodle and online materials

According to the Moodle logs, except for Teacher D, the other three teachers had not logged into Moodle after the training section. Thus, during the short talks the researcher asked if they found any difficulties that obstructed. They responded:

> *I intended to check it [Moodle] but forgot my account details.*
>
> <div align="right">(Teacher A)</div>

> *I'm too busy to check it.*
>
> <div align="right">(Teacher B)</div>

> *It takes effort to log into Moodle, and it is a hassle to enter my account username and password every time. It would be better if we can access it directly.*
>
> <div align="right">(Teacher C)</div>

Since this research aimed to observe how the teacher participants adopted new technology in a natural context, the researcher did not force the teachers if they did not feel like doing so. Moreover, the researcher tried to make the teachers feel at ease to allow them to reveal their real thoughts. In another classroom observation, Teacher A revealed that:

> *Honestly, we [the teachers] are very busy, and we have meetings. I think merely logging into the system is easy. I can do it anytime, so it's not urgent [to use*

it].

<div align="right">(Teacher A)</div>

Additionally, as Teacher A had a negative experience with the X System that she had used before, she held a pessimistic attitude toward Moodle, though she had the authority to design the contents this time.

> *X System was developed by unprofessional teachers, who are engineers and literature teachers…The system is unhelpful to the students, but the superiors requested us to use it even though I didn't want to…We were disappointed with the system, so we do not have any expectations about it [Moodle] now.*

<div align="right">(Teacher A)</div>

In contrast to Teacher A, Teacher B seemed to hold an optimistic attitude toward integrating technology for future teaching, though he did not use Moodle or online materials during the research period. Teacher B claimed that he was satisfied with the existing LMS, and he would not shift to Moodle until the university eliminated the existing one. He expressed his expectations as follows:

> *Although I teach language, I hope Chinese character and speech recognition technologies can be well-developed sooner…I don't worry that Google Translate will replace language teaching. The interest in learning a language is to observe it…For example, YouTube's automatic subtitles and automatic translations are progressing, but those are "external language". The knowledge and experience "inside" the language are the things we should teach in the future.*

(Teacher B)

Teacher C revealed that he had limited knowledge of the LMS usage, but he was considering how to apply it in the future, as he said:

I am not sure how to fit it into my teaching, and this is what the teachers have to put effort into. I can't use it [Moodle] very well, but I think I may use it to introduce Chinese culture and songs to the students. I think it's good for them to learn at home…If Moodle is implemented, I can let the students watch videos and listen to songs not only in class but also at home…I can upload the materials for out-of-class activities and assignments. I'm thinking about how to teach with Moodle in the future.

(Teacher C)

Teacher D was the only one who had tried Moodle and used the online materials, not only in the classroom but also outside of the classroom. However, after trying various materials, he seemed to prefer the traditional methods that he had used before.

The students did not use YouTube to watch the textbook-related videos [the videos produced by the textbook publisher]. After all, letting them recite the textbook is better.

(Teacher A)

During the classroom observations, Teacher D sometimes allowed the researcher to have about 10 minutes to provide learner training on Moodle and the online materials. The researcher used Kahoot! (a game-based quiz platform) to help Class D2 practice

Chinese measure words in one of the classes. Therefore, in the interview, the teacher was asked about his reflections on the materials that the researcher used.

> *The form of game-based teaching with team working…And giving the winners snacks. Can they really learn from that? It is interesting, but they end up having fun…It's interesting, but for the students' sake, it's better to have a test after that, or they will forget their learning.*

> (Teacher D)

It seems that the teacher believed traditional assessment methods work better than interactive exercises, which affected his adoption of materials used. This is probably the reason why he preferred Quizlet, which provides Chinese words and pinyin on one side and the Japanese translation on the other side, which coincided with the vocabulary quiz (paper-based format) he had in the class. However, Quizlet is not without technical problems, which were found during the classroom observations, as Teacher D complained that the free version of Quizlet popped up with advertisements which were quite bothersome.

> *It always pops up with bizarre ads that I don't want to see.*

> (Teacher D)

From the teachers' responses above, we can see that their expectations of Moodle and the online materials are likely based on the previous experiences they had. The experiences, in terms of learning and using educational technologies, have somehow formed their beliefs regarding their future usage. This might explain why Teacher A resisted "new" technology, because of her negative experience of the "old" technology.

Similarly, Teacher D's reflections were also based on his past experiences, as he believed "*the old methods work better*" though he had tried new methods. This can also explain why Teacher B held a positive attitude toward "new" technology, because he learned from his kids' English learning experience; additionally, as he kept learning English, he was able to see how his English teachers taught with "new" methods.

(7) Perceived students' motivation of engaging in Moodle and online materials

The researcher asked the teachers if they thought their students were using Moodle and the online materials to practice Chinese. Most of the responses were related to the students' motivation that they perceived. As the teachers thought the students were not motivated to learn the language, they presumed that the engagement in learning outside of the classroom was relatively low, which affected the teachers' motivation for using technology for teaching at the same time. In their words:

> *I assume they [the students] are not using it [Moodle]…They said "they forgot [to do it]" which is an excuse. They are not active in learning…There is a lack of motivation in this class. The other students aim to get a certificate of HSK and Chinese proficiency test to put on their CV, but the students in this class don't even want to get it. They think it is not necessary to study hard. They have practical goals, so they are thinking about time-cost. They are not keen on acquiring knowledge of the Chinese language. They don't desire to be able to speak and listen…They learn for the purpose of passing examinations. They are not interested in Chinese culture and society…They don't learn at home.*

> (Teacher A)

Teacher B revealed that he used to go to the theatre to watch Chinese films and watched

Chinese TV programs at home to learn Chinese when he was a student. He found that students nowadays find it easy to get exposure to Chinese (language and culture) with the progress of technology, but they do not actually do so, even though they claim they have an interest. The main reason, he assumed, is that it might be because they have "*too many choices*," and he responded:

> *These days, the students are able to watch Chinese films, YouTube and TV programs on the Internet to learn Chinese or get access to Chinese speaking culture, which were difficult to access in the past. However, they have many opportunities now but they don't know what to do.*
>
> (Teacher B)

> *I plan to upload the videos produced by NHK to Moodle in the future….But the students don't even listen to the CD at home or on transport. I think they are not engaging in Moodle…For the students who don't have a device to play CDs nor have a TV to watch the programs, and for the students who don't have a PC, I think uploading the contents may be a chance for them to study.*
>
> (Teacher C)

Although the teachers found a lack of learning motivation in the students, they remained positive in providing supplements to the textbooks through Moodle. Teacher B perceived the students' view on the LMS as such:

> *From the students' perspective, they can listen to the audio at home. Recently, the students no longer use CDs, so it's helpful for them to practice with the online audio at home. In addition to this, if they forget to bring their printouts*

to the class, they can download them from the LMS.

<div align="right">(Teacher B)</div>

Teacher D believed that the students who engaged more frequently on the LMS had better academic performance. The teacher even checked the test sheets to find if there was a relationship between the frequency of listening to the audios through Moodle and their scores on the test. The researcher noted that there might not be a direct relationship, since the performance might depend not only on the frequency, but also on the quality of engagement, students' learning strategies, and methods of assessment. However, Teacher D insisted that:

> *If it [the function of activity records] is utilized well, the students can visualize their learning progress. If they can see it, they may feel they are making progress…The quality of engagement is important as well but making them build learning habits is the first thing to do.*

<div align="right">(Teacher D)</div>

From the extracts above, we can see that the teachers perceived that the students' lack of learning motivation might have a significant impact on their engagement in the online materials on Moodle. However, they generally held positive attitudes toward providing the materials as a supplementary form due to technology trends. For instance, Teacher B and Teacher C were aware that the students did not have a device to play the textbook's CD or have a television to watch the Chinese language learning program they suggested. It seems that the teachers believed the online materials and Moodle might provide additional learning opportunities for the students, and further help the students to build their learning habits.

4.3   Students' Perceptions

4.3.1   Student Pre-survey

Similar to the pilot survey, a pre-survey for the student participants (N = 104) conducted

at the beginning of the 2019 Spring semester aimed to investigate their experiences,

motivations, and goals for learning Chinese; furthermore, to understand their

experiences and attitudes toward using technology to learn Chinese, as well as to

determine what materials to provide in Moodle based on students' interests and learning

goals. The two sections of the survey were analyzed as follows:

(1) Background information and motivations for learning Chinese

From **Table 44**, it was found that the students (N= 104) had varied Chinese language

learning experiences. The students in Class A2 were intermediate learners who had been

learning Chinese in high school for an average of four years, and one of the students

had been learning for seven years. Although Class B2, Class C2, and Class D2 were

supposed to be for beginner levels, one of the students in Class C2 had been learning

for seven years. In Class D2, there was one student who had fourteen years of learning

experiences, and two students claimed they had learned Chinese for one year though

they were *Haafu*, whose parent is Chinese. According to the students' responses on the

reasons for choosing Chinese as a second foreign language, despite them being at

different Chinese proficiency levels a majority tended to learn Chinese for practical

reasons, which are categorised as extrinsic motivations (see **Table 45**). Their goals were

mainly being able to communicate in Chinese (see

Table 46) with responses of "for daily communication," "basic spoken Chinese," and

"being able to talk with Chinese speakers" in the open-ended question. **Table 47** shows

that the students' intended language aspects to learn depended on their proficiency; for

instance, beginners tended to focus on basic language skills, especially speaking, listening, and reading. On the other hand, intermediate learners tended to regard cultural aspects as more interesting (i.e., news, history, and culture).

Table 44 *Experience of learning Chinese (N=104)*

Class	Class A2	Class B2	Class C2	Class D2
n	13	31	27	33
Months	51.1	0	3.1	5.2

Table 45 *Motivation for choosing Chinese courses*

Reasons	A2	B2	C2	D2	T
Intrinsic motivation (T = 80)					
To broaden vision	3	11	15	12	41
To improve self	4	1	3	2	10
Want the challenge of learning a difficult language	0	1	2	0	3
Interested in CH culture	0	3	2	8	13
Interested in CH literature	0	1	0	1	2
Want to make friends with CH	0	2	6	3	11
Want to communicate with CH in my part-time job					
Extrinsic motivation (T = 127)					
For future job opportunities	5	16	11	14	46
Want to study abroad	1	1	0	1	2
Want to travel to CH speaking countries	1	1	3	5	10
Family's suggestion	4	1	5	2	12
Friends'/seniors' recommendation	1	1	3	1	6
Easier to learn compared with other foreign languages	3	3	9	1	16
CH shares similar characters with JP	7	9	6	7	29
To earn credits	2	1	2	0	5
Amotivation (T = 0)					
No ideas	0	0	0	0	0
Others	0	2	4	3	9

Table 46 *Goals for learning Chinese*

Goals	A2	B2	C2	D2	Total
To be able to communicate in CH	4	21	21	22	68
To be able to travel to CH speaking countries	3	0	1	2	5
To be able to read CH	0	1	0	2	3
To be able to listen to CH	0	2	0	3	5
To understand CH laws	0	0	0	0	0
To use CH in the future	0	1	5	4	10
To pass HSK or other certificate exams	0	0	0	0	0
To get academic credit	3	0	0	0	3
Other goals	1	2	0	0	1
No ideas	1	0	0	0	3
No response	1	4	0	1	6

Table 47 *What specific aspects do you want to learn?*

Subjects	A2	B2	C2	D2	Total
Pronunciation	1	13	8	8	30
Grammar	1	6	2	3	12
Listening	1	10	10	18	39
Speaking	1	16	17	23	57
Reading	2	7	10	13	32
Writing	0	7	6	8	21
Certificate	2	2	2	3	9
Learning strategy	1	0	1	1	3
News	5	4	3	4	16
History	4	6	7	3	20
Literature	1	2	2	2	7
Culture	4	4	6	13	27
Travelling	5	6	8	10	29
Drama	0	2	1	2	5
Movie	2	0	0	2	4
Manga	3	0	0	3	6
Song	0	0	1	5	6
Others	0	0	0	0	0
Nothing	0	1	2	2	5

(2) Experience and expectation of learning Chinese with technology

The students' responses in the second section of the survey indicated that almost every student had a smartphone (96%), while four of the students did not respond. **Table 48** also indicates that not every student had a desktop or a laptop. According to one student in the interview, he had just moved to Tokyo and got his first laptop as a freshman after starting university. Since it was the first year and the first semester of college for the students from Class B2, C2, and D2 when the survey was conducted, this might be the reason for not having a device. In addition to a smartphone and a laptop (83%), there was a high ownership rate of an electronic dictionary (70%).

Table 48 *What devices do you have? (multiple selections possible) (n = 104)*

Devices	A2	B2	C2	D2	T
Desktop	2	4	3	4	13 (13%)
Laptop	12	25	23	26	86 (83%)
Tablet	3	5	7	9	24 (23%)
Electronic dictionary	9	24	19	21	73 (70%)
Smartphone	13	28	27	32	100 (100%)
Flip phone	0	0	0	0	0 (0%)

Contrary to the pilot study, the group of students in the 2019 academic year had more experience of using technology for language learning purposes, with more than half of the students (56%) (**Table 49**). However, when asked what "technology" they referred to (see **Table 50**), the majority answered electronic dictionary (32%), CD (20%), software (19%), and application (19%). While it was unclear what software and application they had used, the students stated they used them for learning vocabulary (30%) and listening (30%), followed by grammar (13%), speaking (10%), and reading (10%).

Table 49 *Experience of learning Chinese with technology (N = 104)*

Learned with ICT	A2	B2	C2	D2	T
No	5	17	16	8	46
Yes	8	14	11	25	58

Table 50 *What methods did you use for learning foreign languages?*

What did you use?	A2	B2	C2	D2	T
PowerPoint	0	0	0	1	1
CD	0	10	5	10	25
Video	0	0	0	4	4
Email	0	0	0	1	1
Electronic dictionary	8	14	4	15	41
Software	6	6	4	8	24
Web	1	2	1	3	7
App	2	5	4	13	24
Others	0	0	0	0	0

Table 51 *What language aspects did you learn with the technologies you chose above?*

	A2	B2	C2	D2	T
Vocabulary	7	12	3	16	38
Grammar	3	7	1	6	17
Listening	2	9	8	19	38
Speaking	2	1	2	8	13
Reading	1	1	4	6	12
Writing	2	1	1	4	8
Others	0	0	0	0	0

Based on a 4-point Likert scale, the means of students' attitudes toward using technology for Chinese learning were interpreted as follows (**Table 51**): very high = 3.26-4.00, high = 2.51-3.25, low = 1.76-2.5; very low = 1.00-1.75. The mean ratings in the table show that generally, the students were interested to learn Chinese with the use of technology in and outside class, and desired to receive online materials from the

teachers, as well as to interact with the teachers through SNS or LMS out of class. Meanwhile, the students had a low agreement on the item of knowing how to choose and use appropriate online materials and tools for learning purposes. Compared with the beginner learners, the students from Class A2, who were intermediate learners, reported less knowledge of choosing and using appropriate online learning materials and tools and less willingness to communicate with their teacher through SNS and LMS.

Table 52 *Students' attitudes toward learning through technology (mean)*

(Cronbach's Alpha = 0.784) (N = 104)	A2	B2	C2	D2	M
I am interested to learn Chinese with technology in class	3.69	3.00	2.81	3.24	3.12
I am interested to learn Chinese with technology outside of class	3.08	2.97	3.44	3.24	3.19
I know how to choose appropriate online learning materials	1.77	1.84	2.11	2.42	2.09
I know how to use online tools for learning	1.92	2.23	2.33	2.48	2.30
I hope the teacher can provide appropriate online materials for me	3.08	2.94	3.48	3.21	3.18
I want to communicate with the teacher through SNS/LMS after class	2.38	2.45	3.19	2.88	2.77

4.3.2 Student Mid-survey

After implementing Moodle for a semester, a mid-survey was distributed to the four groups of students by the end of the 2019 Spring semester in which included two sections: (1) the students' reflections on the online materials and Moodle, and (2) the 4-point attitude scales measuring the students' perceptions of using the online materials and Moodle.

The frequency counts in **Table 53** indicate that after a semester of learning, more

students intended to learn grammar (an increase of 27 students) and pronunciation (an increase of 10 students) compared with the results in the pre-survey. It can also be seen that more students claimed they were interested in learning Chinese through dramas and movies, an increase in the total number of 15 students, and one student in Class A2 responded that he wanted to learn about "art" as he answered "others." **Table 54** shows that approximately half the students (47%) tended to search the internet when they had difficulties or problems in learning Chinese. Since it was a multiple-choice question, some of the students also selected the items of seeking help, for instance by asking their friends (26%) and class teacher (10%), while 10% of the students found solutions by themselves. One student further stated that he referred to textbooks and other books.

Table 53 *What language aspects are you interested to learn through Moodle? (N = 103)*

	A2	B2	C2	D2	Total
Pronunciation	5	16	9	10	40
Grammar	8	8	10	13	39
Listening	6	15	11	14	46
Speaking	5	17	16	14	52
Reading	5	8	6	8	27
Writing	4	6	6	7	23
Certificate	7	0	5	2	14
Learning strategy	0	3	4	2	9
News	1	2	2	4	9
History	2	4	5	4	15
Literature	0	1	0	3	4
Culture	4	7	5	11	27
Travelling	2	5	7	13	27
Drama	1	2	6	8	17
Movie	1	2	5	10	18
Manga	2	0	1	8	11
Song	0	2	2	10	14
Others	1	0	0	0	1

Table 54 *If you have questions about Chinese learning, what will you do?*

	A2	B2	C2	D2	Total
Solve it by myself	1	5	8	4	18 (10%)
Search the internet	11	17	25	29	82 (47%)
Ask my friend	4	15	10	16	45 (26%)
Ask my senior	0	3	0	1	4 (0.2%)
Ask a native speaker	1	1	3	0	5 (0.3%)
Ask the class teacher	4	7	1	4	16 (0.9%)
Ask another teacher	0	0	0	0	0
Ask someone else	0	1	0	1	2 (0.1%)
Find other ways	0	1	0	0	1 (0.1%)
Do nothing	0	0	0	0	0
Others	0	1	0	0	1

From the question asking if the students had used Moodle (**Table 55**), we can see that the students from Class A2 reported no engagement, and only a few students from Class B2 and Class C2 had used it. While Class D2 applied Moodle in their formal course, still one student had not used it, as he claimed that he "didn't even know we had Moodle." **Table 56** and **Table 57** summarize why the students had or had not tried using Moodle in the open-ended question. Most of the students who had not used it did not give a specific reason, while most of the students identified a lack of motivation, with 15 frequency counts. Also, seven students in Class B2 noted they had technical problems in using it. On the other hand, students in Class D2 mainly used Moodle for submitting assignments as the teacher required. They also viewed the content related to the formal lessons (i.e., textbook texts, vocabulary lists, audios), and the same uses could also be found from the reasons Class B2's students reported. Interestingly, one student responded to why she used it merely "because the teacher made it," demonstrating social motivation.

Table 55 *Have you used Moodle so far?*

	A2	B2	C2	D2	Total
Yes	0	3	2	32	37
No	12	26	26	1	65

Table 56 *Reasons for not using Moodle*

	A2	B2	C2	T
Motivation				
I don't have the motivation	2	1	0	3
I don't have the chance to use it	1	0	1	2
I don't have time to use it / I am busy with club activities or other subjects	0	11	0	11
I am satisfied with face-to-face classes	0	2	2	4
I use other online materials	0	1	0	1
Technical Problems				
I have difficulties logging in	0	1	0	1
I don't know how to use	0	4	0	4
I forgot how to use it	1	2	0	3

Table 57 *Reasons for using Moodle*

	B2	C2	D2	T
For reviewing my lessons	1	0	6	7
For listening to the audios	2	0	6	8
For using the vocabulary list (Quizlet)	0	0	4	4
For completing assignments	0	0	18	18
For preparing for tests	0	0	2	2
Others	0	0	1	1

In the open-ended question, the students were asked if they had any comments on the online materials or Moodle. The responses were categorized in

Table 58. As can be seen, Class A2's students did not give specific comments, probably because none of them had used it. Nine students gave positive feedback on Moodle, especially with the mp3 function of Moodle and Quizlet, as the students reported:

"I forgot the pronunciation that we learned in the class, so it is nice to listen to the audios at home."

(Student #B4, Class B2)

"I use Quizlet in conjunction with Moodle many times. Thanks to this, I can improve my vocabulary skills."

(Student #D11, Class D2)

Negative feedback was also noted, which was mainly about technical problems. Since the Moodle application was unstable at that moment, and several technical issues in the App Store ratings and reviews had been found, one student reported:

"I found an error when using the app to listen to the audios."

(Student #D19, Class D2)

In addition to the comments, the students also required more materials, such as tools to check their pronunciation and practice speaking skills.

Table 58 *Comments on the online materials and Moodle*

	A2	B2	C2	D2
Positive feedback (T = 9)				
It is nice to have the audio functions	0	2	0	0
I would like to use it more actively	0	1	0	0
It is convenient to submit assignments	0	0	0	1
It is easy to use	0	0	0	3
It is useful	0	0	0	3
Negative feedback (T = 3)				

It takes time to load the site through Moodle	0	0	0	1
I want to know more about how to use it	0	1	0	0
Technical problems in the app	0	0	0	2
Request for more functions or content (T = 14)				
Provide pinyin with the texts/Quizlet/songs	0	1	0	2
Check pronunciation	0	0	3	0
Practice communication	0	0	4	0
Listening materials	0	0	1	0
Content about HSK certificate test	0	0	1	0
Chinese songs	0	0	0	1
More vocabulary lists	0	0	0	1

The table below (**Table 59**) indicates the student participants' attitude toward adopting online materials and Moodle. It was noted that the survey distributed to Class A2 and Class C2 was different from Class B2 and Class D2's, because the engagements in Moodle in the former classes were relatively lower. Also, since the students had not used it after the introduction, they were not clear enough about Moodle's features to rate the scale. According to the scale ratings, the students rated themselves as having lower confidence and less knowledge of using and choosing online materials. However, Class D2's students rated higher agreement on the items of "easy to use technology for learning" and "knowing how to use online materials," which might be because they had practical experiences of using Moodle for their formal learning in class. It can also be seen that the students regarded their current learning and teaching practices as sufficient across the four classes. It is interesting that only the students in Class C2 rated higher satisfaction in learning and lower satisfaction in teaching, which was opposite to the other classes.

Regarding the items related to the values of using online materials and Moodle for learning Chinese, the students rated high agreement on interests, beliefs, extrinsic

motivations, and social motivations, as well as low agreement on concerns and costs. Again, Class D2's students tended to have more positive attitudes than the other classes, particularly on the item "Moodle is useful for classroom management" with a very high rate of agreement (M = 3.29). At the same time, the students perceived that Teacher D had a lower interest in educational technology integration (item 29) and fewer digital skills for teaching (item 23), which might be because they had seen how the teacher used the online materials and Moodle in class. Besides this, although none of the students in Class A2 had engaged in the online materials through Moodle, they rated the highest agreement on the item "Hope teacher will choose online materials" (M = 3.33) among the four classes.

Table 59 *Students' attitudes toward learning through online materials and Moodle (mean)*

A2 & C2 (Cronbach's Alpha = 0.842) (N = 40) B2 & D2 (Cronbach's Alpha = 0.943) (N = 63)	A2	B2	C2	D2	M
Expectancy					
Confidence					
-Confidence in digital skills (Q5)	2.50	2.03	1.96	2.15	2.16
-Easy to use technology for learning (Q6)	2.33	2.24	2.21	2.53	2.33
Knowledge					
-Choosing appropriate online materials (Q11)	2.33	1.93	2.00	2.18	2.11
-Knowing how to use online materials (Q12)	2.17	2.03	2.29	2.44	2.23
Importance					
-Satisfied with current learning practices (Q19)	2.75	2.69	2.75	2.79	2.75
-Satisfied with current teaching practices (Q20)	3.00	3.17	2.71	2.85	2.93
Value					
Interest					
-Interested in learning through online materials in class (Q9.1)	2.83	2.69	2.96	3.03	2.89
-Interested in learning through Moodle in class (Q9.2)		2.66		3.06	2.86
-Interested in learning through online materials	2.75	2.90	2.86	3.09	2.95

outside of class (Q10.1)					
-Interested in learning through Moodle outside of class (Q10.2)		3.00		3.18	3.09
-Interested in engaging in learning activities through online materials (Q16.1)	3.00	2.86	2.86	2.97	2.90
-Interested in engaging in learning activities through Moodle (Q16.2)		2.93		3.03	2.98
Beliefs					
-Online materials can enhance my motivation (Q7.1)	2.58	2.86	2.64	2.74	2.75
-Moodle can enhance my motivation (Q7.2)		2.97		3.21	3.09
-Online materials can help me gain more exposure to Chinese culture (Q8.1)	2.75	3.10	2.86	3.06	3.01
-Moodle can help me gain more exposure to Chinese culture (Q8.2)		3.10		3.06	3.08
Perceived Cost					
-Using online materials adds to my work (Q18.1)	2.25	2.17	2.64	2.21	2.34
-Using Moodle will add to my work (Q18.2)		2.17		2.24	2.21
-A lack of financial or technical support (Q24)	2.75	2.41	2.29	2.21	2.42
Concerns					
-Worry about how teacher will control learning pattern through online tools (Q21.1)	2.42	1.93	2.50	2.21	2.21
-Worry about how teacher will control learning pattern through Moodle (Q21.2)		1.93		2.24	2.09
Extrinsic Motivation					
-Online materials are useful for learning (Q15.1)	2.83	2.97	2.96	3.06	3.00
-Moodle is useful for learning (Q15.2)		2.97		3.21	3.09
-Online materials are useful for classroom management (Q17.1)	3.00	2.90	2.79	3.18	2.96
-Moodle is useful for classroom management (Q17.2)		2.86		3.29	3.08
Social motivation					
-Hope teacher will choose online materials (Q13)	3.33	2.97	2.93	3.15	3.10
-Want to communicate with teacher through SNS/LMS after class (Q14)	2.92	2.69	2.29	2.62	2.63
-Want to communicate with teacher through Moodle after class (Q14.2)		2.62		2.74	2.68
-Teacher is interested in educational technology	2.75	2.72	2.57	2.59	2.66

integration (Q22)					
-Teacher is able to teach with technologies (Q23)	2.92	2.86	2.68	2.62	2.77
-A lack of sharing and discussing educational technology among the students (Q25)	3.00	2.72	2.50	2.50	2.68

4.3.3   Student Post-survey

After two semesters of Moodle implementation, a post-survey was conducted to investigate changes to the students' motivation and attitude. Due to the institutional policy mentioned in Chapter 3, the students who had not learned Chinese before were required to take two years of courses, and those who had had to take a one-year course. Thus, as shown in **Figure 22**, all the intermediate learners in Class A2 responded that they would not take Chinese courses after earning the required credits; however, the beginners in the other classes had to continue their learning. In addition to institutional policy reasons, some students still stated other reasons (see **Table 60**). The responses show that the students in Class D2 had more internal motivations to continue their learning compared with Class B2 and C2, as they replied that it was enjoyable to learn Chinese (4 students), and they were interested to learn more about the language (4 students). It can also be seen in **Table 61** that Class D2's students regarded enjoyment as the most crucial motivating factor; however, the students in Class B2 and Class C2 viewed their goals as more important for their learning. Again, although Class A2 were intermediate learners the students seemed to be less motivated, as three students (25%) did not have a clear idea about their motivation.

Figure 22 *Q1: Would you like to take a Chinese course next semester?*

(Class A2: N = 12, Class B2: N = 29, Class C2: N = 21, Class D2: N = 29)
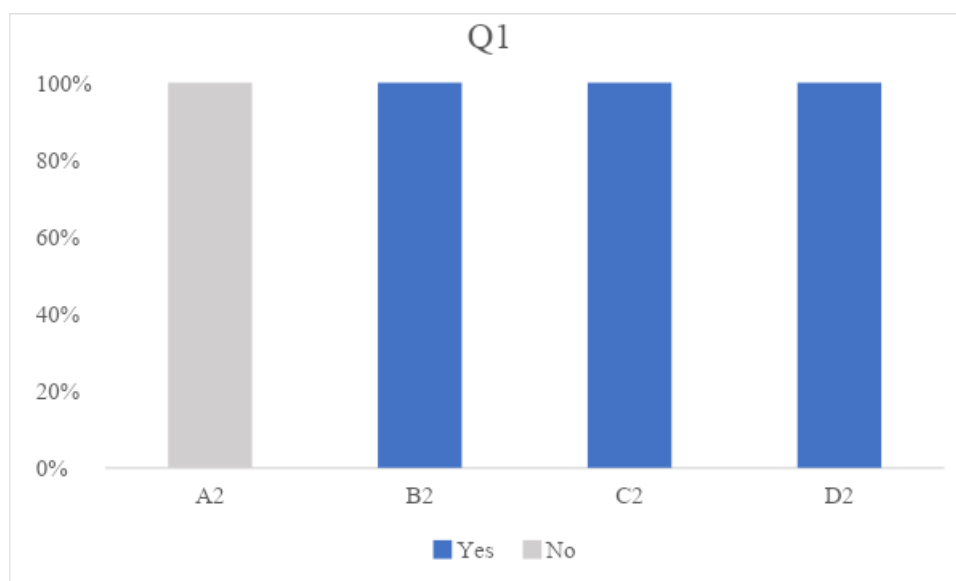
Table 60 *Reasons to/not to continue to learn Chinese*

	A2	B2	C2	D2	T
Keep learning					
To earn the required credits	0	19	14	11	44
It is a practical language to learn	0	1	0	0	1
Because I have already learned for one year	0	1	0	1	2
I want to get a certificate	0	1	0	0	1
I want to go to Chinese speaking countries	0	1	0	1	2
I want to learn more about the language	0	2	3	4	9
I want to learn about Chinese law	0	0	0	1	1
It is enjoyable to learn the language	0	1	1	4	6
Not learning					
I already received the required credits	9	0	0	0	9
I am not good at learning languages	1	0	0	0	1

Table 61 *Q2: What/Who makes you motivated to learn Chinese?*

	A2	B2	C2	D2	T
My goals	3	10	9	10	32
Teacher	3	5	4	3	15
Friend	2	4	1	2	9
Native speaker	1	5	5	4	15
Materials	0	2	0	4	6
Culture	1	2	2	1	6

Enjoyable	1	4	5	13	23
Environment	0	0	1	1	2
Others	0	0	0	0	0
No ideas	3	2	0	3	8

To see how the students intended to sustain their learning outside of the classroom after one year of learning Chinese, the item about the aspects they were interested in learning in the post-survey focuses on language skills. **Table 62** indicates that the majority of the students wanted to improve their reading skills (23%), vocabulary (17%), writing (16%) and listening (16%), which might be because the students perceived these skills as more important and easier for them to learn outside of class. For example, the students might think speaking skills should be acquired in class with the teacher correcting their pronunciation.

Table 62 *Q3: What language aspects do you want to learn out-of-class?*

	A2	B2	C2	D2	T
Listening	0	5	13	15	33
Speaking	1	7	4	9	21
Reading	3	15	15	14	47
Writing	4	12	10	8	34
Translation	5	1	1	6	13
Grammar	1	5	8	11	25
Vocabulary	3	7	8	17	35

The second section in the post-survey was to investigate what methods and tools the students used to learn Chinese in the past year and also if the students were interested in using other methods to learn Chinese. **Table 63** reveals that the students still relied more on paper-based materials such as textbooks and printouts. Two students replied that they also bought reference books from bookstores. Similarly, a total of 20 students

responded that they used textbooks and a printed dictionary as their learning tools (**Table 64**). Although most of the students claimed to use smartphones as their learning tool (34 students used Google and 15 students used websites), they explained in the interview they might refer to the browsers they opened through their smartphone to look up a word.

Table 63 *Q4: What methods do you use to learn Chinese?*

	A2	B2	C2	D2	T
Internet	6	1	2	1	10
YouTube, Netflix, movies	1	1	4	1	7
NHK TV	0	1	1	1	3
Smartphone, app	0	1	1	2	4
SNS	0	1	0	0	1
The existing LMS	0	2	0	0	2
Moodle	0	0	0	8	8
Travelling	0	1	0	0	1
Textbooks, printouts	2	18	8	7	35
Other books	2	1	5	8	16
Others	0	1	0	1	2
No answers	1	2	0	0	3

Table 64 *Q5: What tools do you use to learn Chinese?*

Tools	A2	B2	C2	D2	T
Textbook	1	2	3	7	13
Dictionary	0	4	3	0	7
Electronic dictionary	1	3	6	2	12
Smartphone application	1	6	3	7	17
Google through smartphone	6	10	5	13	34
Google through PC	1	1	0	1	3
Website through smartphone	5	2	2	6	15
Website through PC	1	1	0	0	2
Others	0	1	1	0	2
Nothing	1	2	1	0	4

Aside from the online materials provided through Moodle, the students were asked if they were interested in using SNS (i.e., Line, Instagram, Twitter) and video sites (i.e., YouTube and Netflix) that they had been using in their everyday life (see **Table 65**). While a large percentage of the students (70%) had not used SNS and video sites to learn Chinese (**Table 66**), 67% of 92 students claimed they were interested in this method (

Table 67).

Table 65 *Q6: What SNS/video sites do you use in your daily life?*

	A2	B2	C2	D2	T
Line	12	30	20	27	89
Instagram	11	24	14	20	69
FB	2	0	0	3	5
Twitter	9	17	13	15	54
TikTok	11	0	0	1	12
YouTube	0	21	13	17	51
Netflix	3	3	2	3	11
NicoNico	0	1	1	1	3
BiliBili	0	0	1	0	1
Others	0	0	1	0	1
Not using	0	0	0	0	0

Table 66 *Q7: Have you used the SNS/video site you chose above to learn Chinese?*

	A2	B2	C2	D2	T
Yes	0	9	7	11	27
No	12	20	14	18	64

Table 67 *Q8: Are you interested to learn Chinese via SNS and video sites?*

	A2	B2	C2	D2	Total
Yes	6	21	17	18	62
No	6	9	4	11	30

Q8
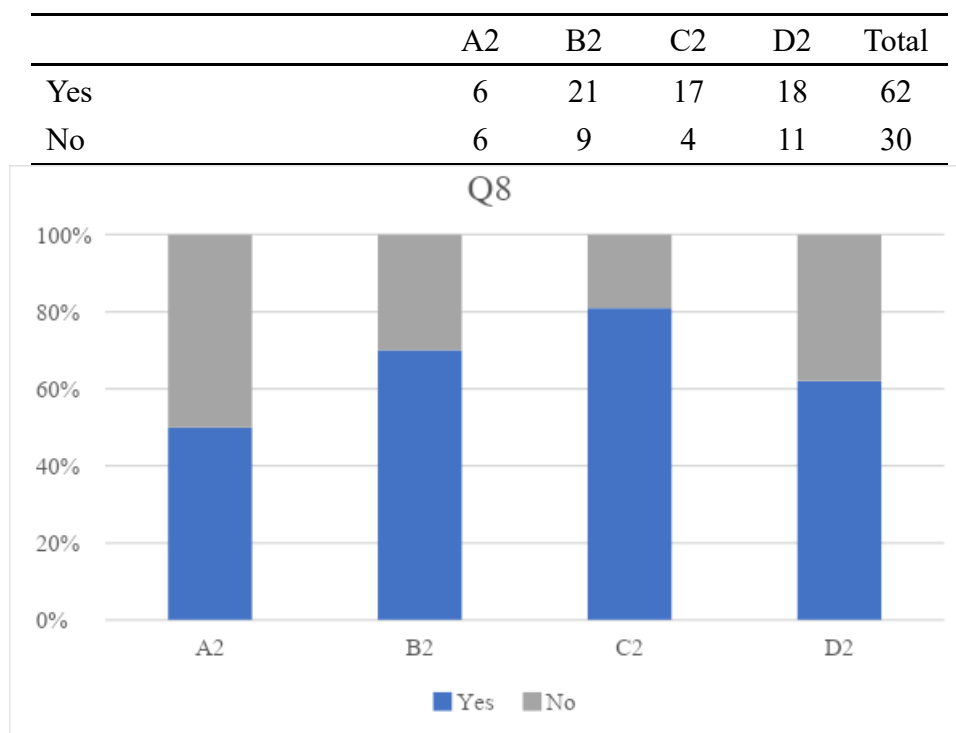
As reported at the end of the one-year Moodle implementation (see **Table 68**), still none of the students in Class A2 had used it, and a small number of the students Class B2 and Class C2 had. Since Teacher D did not assign any homework through Moodle in the 2019 Fall semester, five of the students reported that they did not use it. The reasons why the students did and did not use Moodle were summarized in **Table 69** and **Table 70**. Again, the lack of motivation is the main reason; besides this, six students noted they "forgot the existence of Moodle," and one student stated that she preferred to use books, which were categorized as "other reasons." On the other hand, 37% of 60 students used it to listen to the textbook audios and other content related to their formal lessons. Only two of the students used the materials which were not related to their formal lessons, as they reported that they checked the inserted YouTube links to watch videos and songs through Moodle.

Table 68 *Did you use Moodle in the second semester?*

	A2	B2	C2	D2	Total

Yes	0	2	4	24	30
No	12	28	17	5	62
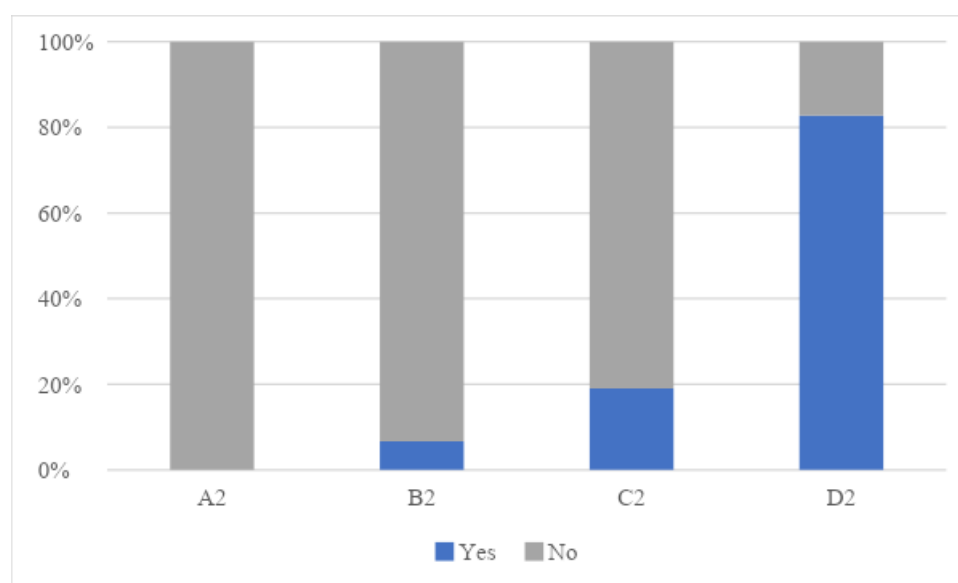
Table 69 *Reasons for not using Moodle (n = 62)*

	A2	B2	C2	D2	T
Motivation					
I don't have the motivation	4	1	0	0	5
I don't have the chance to use it	0	4	0	0	4
I don't know have time to use it / I am busy with club activities or other subjects	0	5	0	0	5
I am satisfied with the face-to-face classes	0	2	0	0	2
Technical Problems					
I have difficulties logging in	0	1	0	1	1
I don't know how to use it	1	6	0	0	7
Other reasons	0	2	2	1	5

Table 70 *Reasons for using Moodle (n = 30)*

	B2	C2	D2	T
For reviewing my lessons	2	1	2	5
For listening to the audios	0	1	10	11
For using the vocabulary list (Quizlet)	0	1	3	4
For completing assignments	0	0	2	2

Others	1	1	1	3

From the comments summarized in **Table 71**, we can see that the students that were more engaged in Moodle tended to give more positive feedback; for instance, Class D2's students perceived it easy and useful to use. However, one student from Class A2 had not used it, but perceived it difficult to use. The other negative comments were mainly due to the technical issues which were difficult for the researcher to solve (e.g., the compatibility of web browsers and applications).

Table 71 *Comments on the online materials and Moodle*

	A2	B2	C2	D2
Positive feedback (T = 14)				
It is nice to have the audio functions	0	0	1	1
It is easy to use	0	1	0	5
It is useful	0	1	0	4
It is enjoyable	0	0	0	1
Negative feedback (T = 7)				
It takes time to load the site through Moodle	0	0	0	1
I want to know more about how to use it	0	1	0	1
Technical problems in the app	0	1	1	0
It is difficult to use	1	0	0	1

The same attitude scale in the mid-survey was conducted again at the end of the second semester; however, the students' attitudes toward learning through online materials and Moodle did not change significantly, as shown in the table below (**Table 72**). It can also be found that the beginners in Class B2, Class C2, and Class D2 increased in confidence and knowledge in selecting and using technology for learning with time, while the intermediate learners in Class A2 decreased in these areas. Regarding the importance of integrating technology in the classes, the students were asked if they were satisfied

with the current teaching and learning practices (Q5 and Q6). As mentioned previously, Class A2, Class B2, and Class C2 did not adopt the online materials and Moodle in their classes, and most of the students did not report any engagement. Class A2's students became more satisfied with the teaching, and Class B2's students became more satisfied with their learning. While Class D2 was the only class that adopted new technologies in class, the students did not seem to be satisfied with the current practices. However, it is unclear if the reasons were because of the technology adoptions, since these might include the teaching approaches, learning strategies and so on, as Class C2's students rated lower agreement on the items. Also, the students had more positive attitudes toward using online materials than Moodle, for example the items related to interest, usefulness, and beliefs in enhancing motivation.

Compared with the attitude scale in the mid-survey, it can also be seen that the four classes of students' interest in the use of online materials and Moodle regardless of in or outside of class (Q15.1, Q15.2, Q16.1, Q16.2, Q22.1, Q22.2) had decreased in general. Furthermore, they seemed to perceive more costs (Q24.1, Q24.2, Q30) and concerns (Q27.1, Q27.2) about learning through online materials and Moodle, compared with the previous semester. In terms of social motivation, the students rated lower agreement on the items; in particular, Class C2's students perceived their teacher had less interest and ability to teach with technology compared with the other classes.

Table 72 *Students' attitudes toward learning through online materials and Moodle (mean)*

(Cronbach's Alpha = 0.929) (N = 92)	A2	B2	C2	D2	M
Expectancy					
Confidence					
-Confidence in digital skills (Q11)	2.25	2.27	2.43	2.55	2.37

-Easy to use technology for learning (Q12)	2.25	2.70	2.62	2.59	2.54
Knowledge					
-Choosing appropriate online materials (Q17)	1.83	2.17	2.24	2.24	2.12
-Knowing how to use online materials (Q18)	2.08	2.43	2.67	2.52	2.43
Importance					
Satisfied with current learning practices (Q25)	2.67	2.70	2.69	2.66	2.68
Satisfied with current teaching practices (Q26)	3.42	3.10	2.69	2.48	2.92
Value					
Interest					
-Interested in learning through online materials in class (Q15.1)	3.25	2.63	2.86	2.72	2.87
-Interested in learning through Moodle in class (Q15.2)	2.75	2.70	2.86	2.69	2.75
-Interested in learning through online materials outside of class (Q16.1)	2.25	2.77	3.05	2.86	2.73
-Interested in learning through Moodle outside of class (Q16.2)	2.17	2.73	2.90	2.93	2.68
-Interested in engaging in learning activities through online materials outside of class (Q22.1)	2.75	2.97	3.14	2.76	2.90
-Interested in engaging in learning activities through Moodle outside of class (Q22.2)	2.67	2.83	3.00	2.81	2.83
Beliefs					
-Online materials can enhance my motivation (Q13.1)	2.67	2.93	2.90	2.83	2.83
-Moodle can enhance my motivation (Q13.2)	2.58	2.73	2.86	2.79	2.74
- Online materials can help me gain exposure to Chinese culture (Q14.1)	3.00	3.00	2.90	2.76	2.92
-Moodle can help me gain exposure to Chinese culture (Q14.2)	2.83	2.93	2.90	2.76	2.86
Perceived Cost					
-Using online materials adds to my work (Q24.1)	2.71	2.53	2.43	2.45	2.53
-Using Moodle will add to my work (Q24.2)	2.83	2.50	2.43	2.50	2.57
-A lack of financial or technical support (Q30)	2.75	2.40	2.29	2.31	2.44
Concerns					
-Worry about how teacher will control learning pattern through online tools (Q27.1)	2.67	2.30	2.33	2.34	2.41
-Worry about how teacher will control learning pattern through Moodle (Q27.2)	2.50	2.33	2.33	2.48	2.41

Extrinsic Motivation					
-Online materials are useful for learning (Q21.1)	3.08	2.97	2.95	3.07	3.02
-Moodle is useful for learning (Q21.2)	2.75	2.90	2.86	3.07	2.89
-Online materials are useful for classroom management (Q23.1)	3.08	2.97	3.00	3.10	3.04
-Moodle is useful for classroom management (Q23.2)	3.08	2.93	3.05	3.00	3.02
Social motivation					
-Hope teacher will choose online materials (Q19)	3.25	3.10	3.00	3.09	3.11
-Want to communicate with teacher through SNS/LMS after class (Q20.1)	2.42	2.53	2.57	2.62	2.54
-Want to communicate with teacher through Moodle after class (Q20.2)	2.58	2.70	2.67	2.62	2.64
-Teacher is interested in educational technology integration (Q28)	2.33	2.67	2.33	2.52	2.46
-Teacher is able to teach with technologies (Q29)	2.67	2.93	2.43	2.48	2.63
-A lack of sharing and discussing educational technology among students (Q31)	2.83	2.77	2.71	2.52	2.71
-The university should train students in using technology for learning (Q32)	2.92	2.80	2.86	2.86	2.86
-The university should train teachers in using technology for teaching (Q33)	2.83	2.90	2.86	2.97	2.89

4.3.4   Student Interviews (I)

The interviews for the students were conducted twice: (I) after one semester of Moodle implementation (by the end of the 2019 Spring semester) and (II) after one year of Moodle implementation (by the end of the Fall semester). It should be noted that the student participants volunteered to take part in the interviews without rewards and extra scores; also, the researcher did not teach any of the class. Thus, the small number of the students who participated in the interviews was a limitation of the study. Since Teacher C resisted the researcher conducting classroom observations during the 2019 Spring semester, the researcher had difficulty accessing the students, and it resulted in none of the students participating in the interview (I). Moreover, none of the students in Class

A2 were willing to volunteer for interviews (I) and (II), which is likely because none of them engaged in the online materials that the researcher introduced, and they were probably not interested in activities that could not get them extra scores, according to their teacher. The four teachers helped the researcher to encourage the students to volunteer to be interviewed; Teacher D insisted they participate in the interview, which might interfere with the students voicing their real thoughts, and so some might not speak a lot. However, there were some interesting communications between the teacher and the students which were recorded during the student interviews for Class D2, including Teacher D's responses.

One of the aims of the semi-structured interviews with the students was to understand their reflections on Moodle and the online materials, so the researcher could adjust the contents based on the students' feedback. For the students who had not used Moodle or the online materials, the researcher was also curious about their reasons and learning motivations. The significant transcripts were analyzed and extracted thematically, as follows:

(1) Preferable usage and learning methods

The researcher asked if the students had used Moodle for learning so far, and the reasons why or why not. In order to understand the students' motivation for learning through online materials, they were also asked about their preferable usage (i.e., the app or web version of Moodle, the device used, the functions and contents engaged with the most). It was found that the students' favoured usage and learning methods were based on their prior English learning experience and their interest in the contents. For example, Student #B4 had tried Moodle when he was interviewed, for the following reasons:

When I study English, I use Google to look up word meanings, as well as something like Moodle…[For learning Chinese] I have used Moodle to listen to the [textbook's] audios to review the lessons and used it to listen to the songs, because I like music…I haven't checked the other contents yet, but I hope to watch Chinese movies through Moodle…And it will be nice if you can introduce more Chinese songs through it.

(Student #B4)

To clarify if the students had adopted their previous English learning methods to learn Chinese, the researcher asked further:

Researcher: *How did you learn English?*

Student #B4: *When I was a high school student, I used to look up the words I didn't know through Google.*

Researcher: *How about communication?*

Student #B11: *Communication…I didn't have the opportunity to have English communication.*

Student #B4: *We study to pass examinations.*

Student #B11: *Right.*

Researcher: *Do you study Chinese in the same ways now?*

Student #B4 and Student #B11: *Yes.*

Student #B11 had not used Moodle at the time the interview was conducted so he did not speak a lot. The researcher also asked Class D2 if they learned Chinese in the same ways as they learned English before; for instance, learning for passing examinations, and reciting vocabulary and grammar, as well as translating methods. The four students

all admitted to this.

I always study for studying, and I don't know how to keep motivated.

(Student #D11)

Since Class D2 adopted Moodle in their formal class, the researcher wanted to know if they had engaged in other contents, besides the required assignments. They responded as follows:

Student #D11: *I use it for checking the audios with the textbook.*

Student #D26: *The vocabulary…I forgot the name.*

Teacher D: *Quizlet? That is really good.*

Student #D19: *Only for checking vocabulary.*

Student #D26: *The textbook's contents on Moodle are really helpful because they are without pinyin.*

It is likely that the students preferred Quizlet, as well as the texts and audios on Moodle, simply because they had a vocabulary test and recitation activity in class. The researcher asked further about how and when the students tended to engage in the materials through Moodle to understand their device and learning condition, and how they felt more comfortable engaging.

I use the Moodle application through my smartphone when I am at home and when I am commuting to school…But I only listen to it.

(Student #B4)

It was found that Teacher D2 and the students' preference of devices varied, as they debated:

> **Student #D11:** *I use a PC to submit the writing assignments.*
>
> **Student #D19:** *I use my smartphone's note-taking application to do it. I copy and paste the notes to submit.*
>
> **Teacher D:** *It is difficult to do so. I don't have a smartphone, but I think it's difficult to write a short essay with my smartphone.*
>
> **Student #D19:** *No. It's easy for me.*
>
> **Student #D11:** *I prefer using a PC because the screen size is larger.*

It was also found that the students had different learning patterns according to their learning conditions. That is, they tended to engage in the online materials based on the learning environment and the types of tasks.

> **Researcher:** *Where do you use Moodle?*
>
> **Student #D11:** *The student study room.*
>
> **Student #D19:** *I listen to the text's audios when I'm on the subway and write the essays when I am at home.*

As can be seen from the conversations above, the students tended to engage in the materials they perceived as interesting, and in the contents which matched their learning strategies which were likely rooted in their previous learning experiences. More importantly, the existing teaching methods and the evaluation methods in their formal course played an essential role as well. That is, the students' learning methods might be affected by their teachers. What their teachers emphasized in the class decided what

and how the students should learn. This could explain why the students and the teacher preferred Quizlet and the textbook's texts and audios on Moodle. Regarding students' learning patterns, the students tended to engage in the online materials with different devices according to the technological affordances they perceived (i.e., using a PC or smartphone to write a short essay); also, they tended to use the different functions according to the learning environment they were in (i.e. listening to audios on the train/completing a writing task at home).

(2) Technical barriers and needs

The researcher wanted to know if the students had found any difficulties in using Moodle and if they had any requirements for the online materials. The responses are shown below:

> **Student #D11:** *I always forget my account username and password.*
>
> **Teacher D:** *That is very complicated.*
>
> **Student #D19:** *You can use the application to log in without your password.*

It is true that Moodle's password policy was quite complex and forced the users to set a stronger password, which the teacher and student found difficult to access. However, Student #D19 recommended they use the app version to overcome the technical difficulties. In addition to the password setting, one student revealed that she found the user interface not that friendly, as she said:

> *It's a superficial thing, but I thought the order of the courses in Moodle was arranged by priority. I thought the first course on the list was the most important one…But it is the Chinese culture course. Aside from this, the icon*

of the course is too simple and abstract, so I don't know what the contents are

about.

(Student #D11)

Besides the technical difficulties, the students also provided some feedback on the materials and Moodle, which were mostly about the contents they perceived to be more relevant based on their needs. For example, Student #B4, who listened to the textbook's MP3 through Moodle, hoped the researcher could add "*the function of repeating the audios*" so he could listen to the audios again and again without pressing the buttons several times. In terms of the content they wanted the researcher to provide, the students responded:

To introduce some sightseeing spots and famous places.

(Student #B4)

We have learned grammar and vocabulary from the texts in the textbook. Thus, it would be nice if we could have more articles on the use of grammar and vocabulary so we can read them when we have free time.

(Student #D11)

Since Student #B11 had not engaged in any of the materials through Moodle he admitted he did not have specific needs, but he said:

The contents can't help me speak a foreign language fluently, so I want to know about learning methods.

(Student #B11)

The extracts suggest that although the technical difficulties the students encountered were not significant (i.e., password policy, visual design and layout), they might have an impact on their user experience and interface. From the feedback, it can also be seen that the students required various contents and functions based on their needs for learning.

(3) Attitudes toward learning with technology outside of the classroom

Since the students tended to use Moodle's materials that were relevant to their formal Chinese course in order to review the lessons, the researcher wondered if they were interested in learning other contents through Moodle.

> *I use the Internet to look up the meaning of the words that I don't know, but I think that is insufficient. I'll try it [Moodle] from now on…I want to learn daily conversation [through Moodle]…Because of the China boom, I know that it is better for me if I am able to communicate in Chinese.*
>
> (Student #B4)

The researcher would like to know the students' motivation for using the online materials and Moodle. The conversations were highlighted as follows:

> **Researcher:** *How do you think the online materials can support students' learning?*
>
> **Student #B4:** *The materials on Moodle are good for me…But for the students who are not using it, I think the fundamental problem is whether they have the motivation to learn Chinese.*

Students #B11: *It's not the application's [Moodle] fault, it depends on each person…What can we receive from it?*

Similarly, the interviewees in Class D2 also expressed their thoughts in terms of the motivation for out-of-class learning. Here are the discussions on "motivation" between Teacher D and Student #D19:

Student #D19: *I want to talk with friends in Chinese, but I found that learning vocabulary is the first thing to do…If I don't know enough vocabulary, I am not able to express what I intend to say…However, if the learning becomes another form of assignment, I feel that is a sense of obligation.*

Teacher D: *The motivation for learning outside of class depends on their time. But if you really love Chinese, you learn without being told to do so.*

Student #D19: *If we use it (Moodle) to study, can we get extra scores? That becomes "motivation." If we engage more, we can get extra scores and acquire Chinese language and culture at the same time.*

Teacher D: *Recently, I read a book called "Education Economics." It said that we have to provide rewards to get something in return. Maybe that is not a bad thing.*

Researcher: *Yes, but that is extrinsic motivation.*

Since Teacher D knew that the students were interested in Taiwanese culture, and many students said they wanted to go travelling to Taiwan someday, Teacher D asked if they had found anything interesting related to Taiwan through YouTube.

Teacher D: *It's easy to find what's popular in Taiwan and to search for*

Taiwanese films and songs through YouTube now. Did you search by yourselves?

Student #D11: *I want to go to China and Taiwan, so I searched for photos. I have found a comic book from China interesting, but I read the Japanese translated one.*

It is interesting to find that the teacher perceived the students were using YouTube to learn language and culture; however, the students tended to use the traditional methods (i.e., books, images). It was also found that the teacher and students in Class D2 had conflicting opinions on using Moodle for learning other contents besides the formal lessons. Teacher D perceived the students had a lack of motivation for engaging in the materials which were not required; however, the students had different thoughts:

Student #D11: *I regard Moodle as a learning tool, so I only open it to study for the formal lessons.*

Teacher D: *They only use it for completing assignments. The other contents are confusing.*

Student #D19: *No. Conversely, because of the assignments, I have the chance to read the other contents.*

Teacher D: *But you don't read the other contents, like culture, by yourself.*

Student #D19: *That's because I don't have time. I have other more important things to do.*

Regarding the motivation for learning through technology, it is critical to know what the students might be interested to learn with. According to the students, game-based elements might be exciting for them to engage in outside of the class. They discussed:

Student #D19: *I thought about this before. How wonderful if learning could be like playing Dragon Quest (a Japanese role-playing video game).*

Student #D11: *For example, a game where we go travelling to China…We can ask for directions on the streets just like we are really there. We can type with pinyin and get replies in Chinese so we can go forward. Wouldn't it be exciting if we could order food in Chinese in the game?*

Teacher D: *That is due to the age gap. After all, different generations have different interests and thoughts.*

The extracts indicated that the students generally held a positive attitude toward using technology for out-of-class learning. However, their motivation for engaging in the task was affected by the cost and reward they perceived, and moreover, their interest. The students seemed to prefer game-based tasks with the use of technology (i.e. video games). However, as Teacher D2 noted, their interests varied and what the teacher perceived as interesting might differ from the students. It is also interesting to find the teacher had conflicted attitudes to the students, as he perceived they had a lack of motivation to learn outside of the classroom and they used more "high- tech" methods (i.e., YouTube).

(4) The role of students

The students seemed to lack motivation for learning Chinese; thus, the researcher asked "What is your role as a student in Chinese learning?" to understand how the students perceived their responsibilities, learning goals and interactions with their peers. They replied:

It's a difficult question…I think the role of students is to be active to communicate in Chinese. There are many students from China at this university, so we should take the chance to talk to them…But I don't have the kind of chance to talk with them in a natural way.

(Student #B4)

While English is quite dominant, if you look around Japan, you'll find a large number of Chinese tourists here. Thus, speaking English is not enough for us to get a job. It's better to speak Chinese as well.

(Student #D11)

The job I want to get may have a lot of opportunities to work with foreigners, so I want to take this chance to learn harder.

(Student #D19)

Teacher D summarized "*They learn for practical reasons, that is, utilitarian purposes.*"

In order to know how the students interacted with their peers, and more specifically, if they had sufficient discussion and sharing about learning methods with their classmates or friends, the researcher asked:

Researcher: *Do you have the kind of chance to exchange your thoughts on learning motivation with peers in or outside of the class?*

Student #B4 and Student #B11: *No.*

Researcher: *Does that mean that you learn at your own pace and with your own methods?*

Student #B4: *Yes.*

Researcher: *Do you think it would be good if you had more chances to discuss your learning with your friends?*

Student #B4: *It is meaningless if my peers have a lack of motivation. I think it's difficult to take that kind of chance. It's better to hold a discussion with someone in a natural way.*

Student # B11: *It's unnecessary to take the chance on purpose.*

The students in Class D2 said that they did not talk about learning methods but only their test performance, such as:

Only like "How's your vocabulary quiz?," "Not so good."

(Student #D19:)

It seems that the students supposed themselves to be active learners, but they tended to act passively and had extrinsic motivations to learn Chinese. Although they regarded interacting with Chinese speakers helpful, they did not actually take the chance to speak with them by themselves. Also, the extracts indicated a lack of discussion and sharing of learning methods among the students, but the students prefer to do this in a "natural" way, which had not happened.

(5) The role of the teacher

To explore how the students perceived teachers' responsibilities and teaching methods, and moreover, the teacher's role of facilitating learning with the use of technology, the researcher asked, "How do you hope your teacher will support your learning?" and the students answered:

Student #B4: *[I hope] the teacher can use daily conversations during break time and teach pronunciation carefully.*

Student #B11: *I hope these can be done in class. After class, I hope the teacher will use Chinese to talk with us…Like friends.*

Researcher: *How about using SNS to practice Chinese with the teacher after class?*

Student #B4 and Student #B11: *That's great!*

Researcher: *Some students want to keep distance with their teacher. How about you?*

Student #B4: *I don't mind.*

Student #B11: *It will be nice if I could ask the teacher anything.*

Since Teacher D was involved in the interview and this question might be embarrassing to reply to in front of him, the students might have a scruple in responding.

Student #D11: *I like to learn with the slides to memorize the texts. It is interesting to speak about what I know. I appreciate that the teacher helps us build fundamental Chinese skills.*

Student #D29: *If we pronounce the wrong tone, we may get a different meaning. Thus, we have to learn from the teacher and practice at home. The teacher can also correct our pronunciation.*

Teacher D: *Right. You don't know if you are pronouncing accurately. It's important to correct students' pronunciation as a teacher.*

Teacher D said that he used to watch Chinese television programs and movies when he

was learning Chinese in the past. He asked the students if they were not interested to Chinese culture due to the relationship between China and Japan.

> *It's simply that we don't have the chance to get access to Chinese culture. I don't have the motivation to learn more about it, so I haven't searched on the Internet...It's better if the teacher can provide more information about that.*
>
> (Student #D19)

These responses indicated that the students tended to rely on their teacher to provide more inputs of Chinese language and culture. More specifically, they believed the teacher should play a role in correcting pronunciation in a traditional classroom, communicating through SNS, building basic language skills, and choosing appropriate materials through technology.

(6) The role of technology (expectations)

The students were asked how they expected technology could support their learning. They suggested:

> **Student #B4:** *Avoiding posting wrong information and paying close attention to it.*
>
> **Researcher:** *Do you know how to judge whether the information is wrong or not?*
>
> **Student #B4:** *No…It is better if the teacher can choose the materials for us.*

The accuracy of the contents of online materials was also mentioned by a student in Class D2:

Audios are essential. The audios should not have any errors, because if we listen to listening materials containing errors, we may acquire incorrect pronunciation habits.

(Student #D19)

Additionally, the students also noted the possibilities of communicating in the target language with the use of technology:

Student #B11: *I want to try to use online chat applications or video calls to talk with people living abroad in Chinese.*

Student #B4: *Right! It's ideal to talk with people in Chinese through a website, so we can improve language skills mutually.*

From the conversations above, it can be seen that the students perceived the role of technology as helping them acquire "accurate language" and communicate with native speakers.

4.3.5   Student Interviews (II)

The second student interviews were conducted at the end of the last semester (Fall 2019) to understand students' reflections on the year of Chinese learning. The interview questions covered not only students' attitudes toward using technology but also their learning motivations, strategies, preferences, and perceptions of teachers' roles. The interview transcripts were extracted with the main categories, along with the subcategories as below:

(1) Perceived teachers' digital, Chinese language, and teaching skills

The students were asked about their Chinese teachers' competency regarding their knowledge, skills, and attitudes. More specifically, how the students perceived the teachers' digital, language, and teaching competencies.

Digital competency

Since the researcher did not have the authority to check the activity logs on the existing LMS, the researcher asked the students if the teachers used the existing LMS for the formal courses. The students in Teacher C's class responded, *"Not at all."* The researcher further asked how the students perceived the teacher's digital skills and knowledge of using a PC and smartphone, and they revealed:

> *He [Teacher C] rarely used the devices in class except to play the audios and the NHK television program…So I'm not clear about that.*
>
> (Student #C1)

> *I think he [Teacher C] doesn't like to use the Internet in class. He prefers a printed dictionary, just like my English teacher and high school English teacher. They said we can memorize words better by opening a dictionary physically and seeing the other usages at the same time…He is "analog" (not tech-savvy). I'm not sure about his digital skills, but he let us watch videos in class sometimes. So…Maybe he is at an intermediate level.*
>
> (Student #C3)

In Class D's student interviews, Student #D29 seemed to refuse the question, as she said, *"I'm not clear about it.*" while another student revealed that:

I think he [Teacher D] has basic skills…Like what he has been doing now. Sometimes the PC doesn't work…I think that is a waste of time. Maybe it would be better if he could be more familiar with the usage.

(Student #D19)

Language competency

The students perceived Teacher C's Chinese language skills as follows:

He [Teacher C] does not pronounce like a native [Chinese speaker], but I appreciate that he teaches us pronunciations in an exaggerated way. That is really helpful.

(Student #C1)

Since the student knew Teacher C was from a Chinese literature background, Student #C3 regarded Teacher C as having professional Chinese language skills, but thought it was not necessary to translate the texts too carefully in the class because the teacher asked the students to translate the textbook and sentences from Chinese to Japanese. He stated "*We become focused on the Japanese translations, and the class becomes a translation class. I don't know how important it is, but for the beginners, it's not necessary.*"

Teaching competency

Class C's students were also asked about the teacher's teaching skills and teaching styles they perceived, and they revealed:

When he [Teacher C] is instructing vocabulary, he makes sample sentences which is helpful...But it is the grammar instruction that confuses me.

(Student #C1)

Student #C3 thought Teacher C's language and teaching skills were "*generally good.*" Although he pointed out the teacher was rigorous, in that "*he speaks to us strictly and doesn't accept our mistakes*" but he admitted that "*It (the teacher's teaching style) may be painful for those who are not mentally strong, but once we get used to it, it's helpful to build basic [language] skills.*"

Moreover, Student #C3 admitted that "*for the sake of graduating from college, students should accommodate the teachers*" and he understood why the teacher taught in these ways:

He is himself. Teacher C has been a professor for a long time, so he has his own values and learning methods. Every teacher has their own views. For us [students], that is what we must do, in order to graduate…Though I think enjoyment is the most important thing.

(Student #C3)

The results above indicated that when being asked about their thoughts on the teacher, the students might be reluctant to voice their opinions. This might be because the students did not want to offend their teachers, even though the researcher had emphasized the interview would not affect their scores. In terms of digital skills, the students judged the teachers' by recalling what the teachers had used in the classroom, as they perceived that Teacher C and Teacher D had basic digital skills, but Teacher C

could not keep up with new technology and Teacher D could have improved his skills. It was found that the students seemed to judge the teachers' language skills from pronunciation (native or non-native like) and academic background. Furthermore, the students estimated the teachers' teaching skills and teaching styles from in-class teaching; also, they tended to accept the teaching methods even though they were not quite satisfied. The extracts showed that the students were conscious of the teachers' competencies, which had been observed in the classroom.

(2) Experience of formal and informal learning

The students' previous learning experiences might have an impact on their current attitude toward educational technology and its usage, thus, their learning methods in terms of contents, strategies, and training on technology use were asked about in the interviews.

Experience of using technology for language learning

The researcher asked if the students had experience of using technology to learn foreign languages; however, most of the students replied they mainly used SNSs (Social Network Services) and YouTube or played games in their daily life but not for learning purposes. The students revealed that:

> *I watched films to learn English before, such as Star Wars. I watched it with English subtitles…My high school English teacher taught us to watch films to listen to English.*

> (Student #D19)

> *When I was in high school, I learned English in a normal way. I did not use*

apps but downloaded the audios to my smartphone to practice listening. I use the same way to study Chinese. When I have free time, I search TED talks to find some interesting things in Chinese.

(Student #D29)

Student #C1 claimed he got his first smartphone recently. He did not use a smartphone for learning previously, but said *"My high school asked us to buy a ChromeBook for in-class learning…We had English conversations with Filipino teachers through Skype…But it [ChromeBook] is really difficult to use because Word and Excel are not available…Eventually, I only used it to watch videos for learning purposes…It is widely agreed that using ICT can help with education…But from my junior high school to university, nothing has changed…We are playing, like games [with ICT]."*

The researcher wanted to know more about Student #C3's experience of using Skype to learn English, as the previous experience might affect his current attitude and usage. The student revealed that:

I think it's meaningless. It was like casual conversations…I received new inputs [from the teachers], but I didn't know how to use them appropriately. The teachers were enthusiastic, but I was not…So I quit after half a year.

(Student #C3)

He further explained that it was not Skype system's faults as he said, "*I think Skype itself is good,*" but the teachers might be unprofessional, and the learning methods did not meet his learning goals.

Language learning experience and strategy

Unlike English, where a symbol represents a phoneme (phonogram), Chinese characters are logograms that indicate a word or morpheme. Therefore, the students' Chinese learning strategies might differ from their previous English learning methods. Due to the features of Chinese language, the students were aware that they applied different learning strategies to learn Chinese to how they learned English before. As they pointed out:

I did not put in so much effort to learn English, because I have been learning it since I was little. I memorized [English] through my ears…[For learning Chinese,] the words come into my head when I get Chinese inputs…If I don't see the word, I don't know how to read it out…

(Student #D11)

I like to learn in a traditional way, and I prefer paper [-based materials]….I believe writing physically helps with memorizing, and my eyes get tired when looking [at screens] for a long time. Also, that's the strategy with which I have been learning; thus, I prefer the traditional ways.

(Student #C3)

Since the researcher had received emails from Student #C3, which were written in Chinese, the researcher was curious how he wrote in Chinese. The student noted a writing strategy he had developed by himself:

I use Google Translate to write my English homework…Copy and paste [write in Japanese and copy the translations from Google] every time. That's why my

English is so bad. I don't use it to write in Chinese, because the mistakes are so numerous that I don't know how to revise. Unlike English, at least I am able to revise…So I use an online dictionary to look for vocabulary and example sentences as a reference, and I also search on the Internet, such as blogs and websites.

(Student #C3)

Experience with the existing LMS

The researcher asked the students if they had used the existing LMS or the other online materials for the other courses in the department, and they responded:

The teachers distribute printouts through it [the existing LMS], and we [students] print it out by ourselves. The teachers seem to use it to grade our scores. In addition to this, we submit assignments through it.

(Student #C1)

We use the existing LMS for other subjects. The teacher asks us to watch the videos to preview the lessons for the next class. After the class, we can take the online test and check the answers by ourselves. I think the system is excellent.

(Student #D29)

Training on the existing LMS

The researcher wanted to know if the students had received any training on the use of the existing LMS and digital skills. If so, where, and how were they trained?

The university distributed a manual in the orientation and asked us to watch

the video which introduced the LMS.

<div align="right">(Student #C1)</div>

Student #C3 mentioned the same process of online training and claimed that though they did not receive much training with the LMS, they were able to use it without specific difficulties. The researcher asked what computer skills he perceived himself as having. The student replied:

I use a PC in a normal way. I learned a programming language before, but I don't remember it…I have basic skills, like using Safari [web browser], Word, Excel, PowerPoint, but merely the basic skills.

<div align="right">(Student #C3)</div>

The extracts mentioned above suggest that the students mainly used their smartphone for entertainment purposes (e.g., SNSs, videos, games) rather than learning purposes. Their experiences of using technology for educational purposes seemed to come from their high school English classes and the other subjects in the college. These experiences could affect their attitudes toward using technology for Chinese learning. The authority of the teachers might be one of the ethical factors affecting their usage, as the learning methods (e.g., watching English films, using the existing LMS) were recommended and determined by their teachers. However, the students were aware that their Chinese learning strategies were different from previous English learning strategies because of the different features of the two languages. Furthermore, the students seemed not to have particular barriers to the existing LMS, which might be because they mainly used the relatively easy functions (e.g., viewing, submitting assignments, downloading documents).

(3) Satisfaction with current practices

Teaching style

Although the students claimed the teacher was strict, they seemed to be satisfied with the current teaching style. They revealed that:

In the beginning of learning Chinese, I prefer a strict teacher. If the teacher is lenient, I may not study by myself. The teacher is strict, so it's easier for me to build basic skills.

(Student #C1)

Teacher C threatens that he will drop students who do not do well on tests, so we study hard. Even though we don't have homework, we have to study before tests.

(Student #C3)

The researcher wanted to know the student's view on the current teaching approach, which was mainly a grammar translation approach. Student #C3 responded that:

I feel really sleepy in the class, and maybe only 10% of the contents come into my mind…Compared with receiving [knowledge in the class], perhaps it's better to have games or discussions that can force us to think.

(Student #C3)

Since Student #C3 tended to speak without reserve, the researcher asked how he regarded the recitation tests that were held in class frequently, as had been recorded:

Researcher: *What do you think the purposes of recitation tests are?*

Student #C3: *To check our pronunciation which Teacher C asks us to memorize.*

Researcher: *Do you know how to use the texts you have memorized?*

Student #C3: *No…Like my English…*

Researcher: *You are good at memorizing and getting high scores.*

Student #C3: *Yes, I memorize [the texts] but don't really understand the meanings.*

Researcher: *Do you want to practice how to use it [the texts]?*

Student #C3: *But the class time is limited, so it's a matter of what is prioritised…And most of the students are not motivated…After all, it is a matter of motivation.*

Attitude toward collaborative learning

Since it was observed that there were mainly one-way interactions (teacher to students) and merely reading the textbooks as a peer activity in the Chinese classes, the researcher wanted to understand how the students viewed collaborative learning.

> *We don't have it [collaborative learning] in English class, but we have peer discussions based on the textbook's questions and practice with the student or teacher that sits next to us…It's good to recite the textbook with peers, but we can't receive knowledge from this…And we can't understand each other if we talk in Chinese. We don't have chances to communicate in Chinese.*
>
> (Student #C1)

We have presentations and group discussions in the other classes, like English

class. For Chinese class, we are all beginners, so there are still lots of things

we don't know…I think we are not able to express what we want to say…And

our classmates may make mistakes.

(Student #C3)

Student #C3 stressed that because of the big size of the class, the students' levels varied, which made collaborative learning impractical. Moreover, he said "*I can learn grammar by myself, but I am too confident with my pronunciation to notice when I pronounce wrong…So I hope the teacher can correct my pronunciation in a smaller class size.*" Although Student #C3 claimed that he hoped more outputs could have been practised in the class, he admitted that:

I am not confident to speak [in Chinese], because I'm not able to do so…And

I don't like to speak in front of the class. It's shameful to make mistakes in class.

It's normal for Japanese people.

(Student #C3)

Student #C3 further revealed that most of the students in Class C were not motivated, as some students dropped the course to take another course next semester, in which it was easier to get the credits.

Similar to Class C's students, the students in Class D seemed to be satisfied with the current teaching, as they replied:

We have lots of group activities in the other Chinese teacher's class, such as

writing and presenting short drama scripts…Teacher D's class is like a normal

class. I don't think we need more group work.

(Student #D29)

I think group work in Teacher D's class is unnecessary…The group work in the

other teacher's class is mainly writing scripts, which decreases my Chinese

levels…The current methods, like the grammar book and the textbook's

vocabulary we are doing now, are more effective. It's good to have group work

but not necessary now. We have to build basic skills in the beginning.

(Student #D19)

Maybe it's no problem for the other students, but I don't have friends…And I

don't want to work with someone who is not enthusiastic…Working with people

may decrease my capacity. I prefer working independently.

(Student #D11)

Attitude toward a supporter

Student #D19 and Student #D29 seemed to be satisfied with the current teaching. Since several technical issues were identified during the class time, the researcher asked the students if they thought it was better to have a teaching assistant (TA) to help the teacher solve technical problems and support his teaching. The students claimed that:

The teacher has no problem with teaching…Though managing the class and

using a PC are time-consuming, he can manage by himself.

(Student #D29)

It's helpful if a TA can help the class run smoothly…But for the current statement, the teacher can make slides which are easy to understand, so I think it's not necessary.

(Student #D19)

On the other hand, Student #D11 thought that might be a good idea to have a supporter to help with technical issues, as the students often reminded the teacher in the class "*Teacher, it's wrong [to click that]*" or "*Teacher, if you click that, it may shut down.*"

The interview responses above revealed that the students seemed to be generally satisfied with the current teaching practices in terms of styles and approaches, and they did not regard collaborative learning activities and a teaching supporter in the class necessary. Since the Chinese teachers did not adopt collaborative learning in their classes, the students' imaginations of the approach were formed by the other classes, which might have negatively affected their willingness to work in pairs or small groups. The students' learning goals, language proficiency, another learner's motivation they perceived, and the "shame culture" in Japan might affect their willingness as well.

(4) Attitude toward using technology for Chinese teaching and learning

Attitude toward devices used in class

It was observed that Teacher C banned smartphone use in the class; thus, the students were asked about their views on the policy:

Teacher C asked us to bring a dictionary to the classroom in the beginning [of the semester], so I do almost [bring it to the university] every day. I bring my electronic dictionary sometimes because it is faster [to look up a word]. He

recommended a printed dictionary and said we can know not only the word meanings but also the associated usages…But when I am in class, I don't have much time to use it [printed dictionary] while the teacher is giving instructions. When I only want to know the word meaning, I look it up with an electronic dictionary, which is faster and easier to understand.

(Student #C1)

Student #C3: *I don't use [any devices] in class. During the class time, I concentrate on what the teacher says, because he speaks very fast. When I watch films for self-learning…I don't have an electronic dictionary, so I use my smartphone to look up words. If I don't know the pinyin, I'll use my printed dictionary.*

Researcher: *Teacher C bans smartphones in the class, but when you want to look up a word, what do you do?*

Student #C3: *If Only Teacher C can change his ways of thinking…Someone should tell him that "It's a good idea to use this on the Internet."…In the university classroom, if a professor says "It's no problem to use your smartphone" maybe lots of students will play games [in the class]. So, it's difficult to allow [the use of a smartphone] only for looking up words.*

Teacher D did not ban devices in class, so the students were observed using not only electronic dictionaries but also smartphones. Thus, the researcher was curious about their thoughts on device use in class, and what they were using, because it was difficult to see their smartphone screens during the classroom observations. A student revealed his views on the devices used in the classroom:

I think it's better to use electronic dictionaries and smartphones in class. I often use Google Translate with my smartphone in class.

(Student #D19)

Student #D11 had the same opinion, as she also used Google Translate in class:

I use it [a smartphone] for looking up words in a dictionary…I haven't inserted the Chinese dictionary into my electronic dictionary yet.

(Student #D11)

Attitudes toward using LMS and online materials for out-of-class learning

Besides the students' attitudes toward using technology for learning in class, their thoughts on using LMS and other online materials for outside of class learning were also important to understand. In their words:

If it [Moodle] didn't have the listening materials, I wouldn't have opened it. Mainly, I use it for [engaging in] test-related materials….If teachers do not take control of the other materials and submissions, it doesn't matter if we use it or not.

(Student #C1)

It's good if the teacher can upload the videos he talked about in the class, so I can watch the videos in my free time…I only studied for passing tests in the first semester. Recently, I have watched films and searched for information about Chinese when I am free. I didn't have the motivation in the first semester. So, it's good if the supplementary materials can be uploaded [to the LMS], and

we can do it whenever we want…But it doesn't have to be compulsory like homework.

(Student #C3)

Student #C3 further pointed out how he perceived the peers' and teachers' motivation for engaging in online materials outside of the class:

I think not many students will use it. From the [perspective of the] teacher's effort…For example, there are 30 students in this class, and maybe only two or three students use it. For these two to three students' sake, it's not necessary [to make the materials].

(Student #C3)

They [online resources] are very useful to help with my assignments…For example, I used Google to complete the Chinese writing assignments. It is very flexible…I can use various tools. On the other hand, it is so flexible that I don't know what is better to use.

(Student #D11)

I think the various contents are very helpful. But to be honest, I don't have much time to use all of them…It's better if the teacher can tell us what to do, like "Please read this by the end of next week." By doing so, though it is our responsibility, we can utilize them [the contents] better.

(Student #D29)

The researcher asked if the students had used a smartphone to look up words, and they

replied:

> *The other Chinese native teacher recommended an online Chinese dictionary,*
> *but the explanations are all in Chinese. Although I can understand the pinyin*
> *from it, I have to search for the meaning [in Japanese] on the other sites.*
> *Sometimes the translations are wrong, but I don't realize…So I rely on an*
> *electronic dictionary.*
>
> (Student #C1)

> *When I'm not sure if the Google Translate is accurate, I check with another*
> *online dictionary…To complete the short essays, I wrote in Chinese first and*
> *pasted it into Google Translate, and then I checked the Japanese translations*
> *with the online dictionary. If the Japanese translations looked strange, I*
> *checked the translations from English to Chinese again, to see if the grammar*
> *structure was correct.*
>
> (Student #D11)

Learning motivation

The students revealed their Chinese learning motivation in the interviews. Student #C1
claimed that she would take a Chinese course the following semester even though it
was not a compulsory course, because:

> *I really hate English…Because I am not good at it. On the contrary, Chinese*
> *is a new foreign language that I have just started to learn, so I want to take the*
> *opportunity to learn more.*
>
> (Student #C1)

I know the importance of learning foreign languages, but my priority is studying the major subjects and getting qualifications. I study foreign languages only before I have tests or when I have free time.

(Student #C3)

Preferable usage of technology for Chinese learning

It was found that the students' thoughts on using online materials in or outside of the classroom varied:

I think it's better to use the online materials in class. The class time is quite long, isn't it? So, it's more effective to finish the learning during class time. In case we don't learn [outside of the classroom], it's effective to use them with a classmate in class.

(Student #D19)

I think using them [online materials] for out-of-class learning is better. Compared with watching videos during class time, I prefer listening to the teacher's instructions…For the students who want to improve their Chinese, they can use it to review the lessons at home or after the class time.

(Student #D29)

Student #C3 mentioned that he searched on YouTube to find films to learn Chinese, but he claimed "*I spend two hours on a five-minute film clip. I paused it to look up the word meanings that I didn't know…That's really frustrating.*" The researcher suggested the student skip the words he did not know and guess the meanings from the contexts and

actors' body language, facial expressions and so on. However, the student argued "*I feel uncomfortable if I don't know the meaning.*" The researcher pointed out the existing learning strategy might reduce his learning achievement, which could decrease his motivation. Student #C3 admitted that he had found the same problem when he learned English, and he claimed:

> *I listened to TED Talks and repeated them again and again to look for word meanings...Word by word...I found it was difficult to sustain, and it became boring...And I lost my motivation.*
>
> (Student #C3)

Since it was observed that Teacher D offered writing assignments through Moodle, the researcher asked how the students completed their writings. Student #D29 said that she used her electronic dictionary to look up words and used the sub-textbook to refer to the structure of sentences. On the other hand, Student #D19 admitted that he used Google Translate because "*The words I don't know are so many that I didn't know how to write an article.*" Student #D19 thought Google Translate was convenient to look up word meanings and to translate paragraphs from Japanese to Chinese, but he reflected "*We shouldn't rely on Google Translate to learn Chinese...Especially when writing Chinese articles.*"

Student #D11 had mentioned that she preferred learning Chinese through handwriting, and she stressed that:

> *I hope to have more writing tasks, because I learn by reading, through my eyes, searching, moving my hands, and memorizing the things I write...I memorize*

by writing. Typing with a PC can't help me memorize things, and I always

forget how to change the keyboard language.

(Student #D11)

The data suggested that the students generally preferred using a smartphone and an electronic dictionary in class for looking up word meanings, as they were available to use. On the other hand, for out-of-class learning, the students' usages were affected by their motivations, learning goals, and previous language learning experiences. Again, it was found that they adopted similar learning methods to learn Chinese, which were developed from prior English learning experiences. However, the students seemed not to realize that the strategies they had been applying were inappropriate (e.g., pausing the video to look up words), and might be a danger to their learning motivation. The students also revealed that they did not know how to choose appropriate materials and judge if they were accurate. Moreover, they tended to rely on the teacher to take control of their learning with a lack of autonomy or self-regulated learning; also, the students perceived their teachers and peers had a lack of motivation for using technology for outside of class learning.

(5) Feedback on Moodle and online materials

Awareness of being tracked on Moodle

The researcher asked if the students noticed their activity logs were recorded through Moodle and the existing LMS. According to the students' responses, Student #C1 and Student #D19 were aware of the tracking function on the LMS because the other teachers had told them, but Student #C3 and Student #D11 had not noticed. Their attitudes toward the recording function were revealed as follows:

I know that [students' activity can be tracked by the teacher], because my English teacher told us that he could see who listened to the audios that he had uploaded to the existing LMS.

<div align="right">(Student #C1)</div>

From the students' perspective, Student #C1 was aware of being tracked on the existing LMS and Moodle. She thought the records were for showing engagement to teachers, and she revealed her views on the tracking function:

I think it is meaningless. Once we open the page, the record leaves, even if we do not actually read the content...It [the records] can make a good impression [to teachers]. I think many students just click it first and read [the contents] afterwards.

<div align="right">(Student #C1)</div>

I think it is really good. Being seen by the teacher makes me study harder. I have to do it [learning through Moodle] because it is related to my scores, which becomes a sense of obligation…A feeling of "need to study." I think it's good for the teacher to manage [our learning] through it [Moodle logs].

<div align="right">(Student #D19)</div>

The other two students said they did not know the tracking functions of Moodle, but they thought:

It becomes motivation in that we have to engage in the tasks.

<div align="right">(Student #D11)</div>

It's scary that the teacher knows everything!...I don't mind if he can give us

extra points, but he should tell us beforehand.

(Student #C3)

The role of the teacher using LMS

Since Teacher D provided materials and assignments through Moodle and gave

feedback to the students, the researcher further wanted to know the students' views on

the feedback provided by the teacher in Moodle. They said:

I think it is necessary. If we can't receive the feedback, we don't know what is

good and what is bad. By receiving the teacher's feedback, we are able to

reflect on our learning and do better next time.

(Student #D19)

After the submission, we can receive Teacher D's comments, like "Here is good"

and "Here should be revised." It is really helpful for the next assignment, so

it's absolutely needed.

(Student #D29)

It was observed that Teacher D did not use the peer review and message functions on

Moodle, and Student #D11 often asked the teacher questions after the class. Therefore,

the student was asked about her views on communicating with the teacher and

classmates through Moodle. She revealed that:

Is it like email or Line? I think it is good if it is like communication…I am allergic to mails, which are painful. If it is like Line, which is a communication tool, it's easier and free to do without time constraints…Maybe for everyone, it's good to ask the teacher questions one-to-one. I feel shy to ask a question in a group.

(Student #D1)

The students in Class D also revealed their motivation for engaging in the contents on Moodle which were not related to their formal class, as well as their peers' motivation:

I think I'll not read [the contents on] Moodle by myself, if the teacher doesn't require it. It's good if the teacher requires us to do it, then it becomes a sense of obligation. Having the sense of obligation, we have the opportunity to know more…About the culture.

(Student #D19)

I think not many students use it in an autonomic manner. It's helpful for the students if the teacher can say something like "Please complete this by next week." By doing so, it doesn't cause us too much effort and it's exciting to read [the contents].

(Student #D29)

Pros and cons of the online materials on Moodle

The students were free to talk about their opinions on the online materials and Moodle without any hesitation; thus, they revealed that:

I practice vocabulary and grammar [with Moodle] frequently. The grammar [materials] are easy to understand…The grammar explanations are clearer than the textbook. They are helpful…But do not work with audios.

(Student #C1)

It will be easier for me to study if example sentences of the textbook could be provided on Moodle.

(Student #C3)

By using Moodle, I can download the textbook's contents and audios, which saves effort…I can also use it when taking a train. That's really good…I can't think of any disadvantages.

(Student #D19)

Since Teacher D adopted various online materials in class, the researcher asked how the students perceived the materials and teaching methods. Student #D19 and Student #D29 thought the methods were good but noted that some students might fall asleep if the materials bored them. Student #D11 also revealed her concerns about using Moodle:

Student #D11: *It's good to use Moodle to preview and review the in-class lessons, like grammar, vocabulary, and assignment submission...But apart from these, it's difficult to know what to do…*

Researcher: *What if the teacher assigns the materials on Moodle for out-of-class learning?*

Student #D11: *If it is a required assignment, I think everyone will do it. If that is not…For me, the logging in process on Moodle is really bothersome which*

I really hate. If the teacher asks us to watch a video on YouTube, I'll search on

Google and link to the YouTube site.

Technical difficulties

According to the students' responses, they did not find any difficulties when using

Moodle to submit assignments and read the contents. They were able to use the general

functions without specific barriers, however they pointed out technical issues on the

Moodle app.

Since Student #C1 used the Moodle app, which is unstable across different systems,

she pointed out that she was unable to listen to the audios through the app with her

smartphone, as she stated, "*I couldn't use the app to play the audios.*" Besides this,

Quizlet changed its policy and required users to sign up with an account to continue the

lesson, thus, the student found it annoying that "*It asks me to log in, or I can't read it.*"

The login issues on Moodle were noted by the students:

> *We have to log in again after a period. I hope it [the login process] can be*
>
> *removed…It's difficult to use.*
>
> (Student #C3)

> *By using the Moodle app, the personal data is saved so we can atomically log*
>
> *in…But once the site switches to Safari, we have to log into the website…That*
>
> *is a hassle.*
>
> (Student #D19)

It's time-consuming to log in to Moodle and open it…

(Student #D11)

In addition to the login issues, Student #D11 also noted that Wi-Fi speed restrictions might make it difficult to access the online materials: "*I hope to use Moodle offline, because I have limited Wi-Fi data usage.*"

According to the data, the students seemed not to worry about being tracked through the LMS, which might be because they regarded the activity logs as a motivation to engage and for making a good impression on teachers and getting extra scores. They also appreciated that the teacher could provide feedback on their assignments through Moodle. One of the students further revealed that she preferred the online communication with the teacher that could be conducted individually in a text message format. This might be because of her anxiety to write emails, as she was more familiar with SNS (e.g., Line) and too shy to speak in a group. The students also mentioned the advantages and disadvantages of the online materials and the Moodle system as they discussed the utility of the contents, the mobility (e.g., ability to learn when commuting), and additionally the technical issues they encountered. The reluctant login process to Moodle was the most common complaint that was found in the interviews.

4.4   Engagement

4.4.1   Moodle Logs

Exporting the activity logs from the Moodle built-in recording, the data was downloaded in Microsoft Excel format as shown in the screenshot below (**Figure 23**), and the explanation of each attribute can be seen in **Table 73**. Since the recordings

included the researcher's activity logs (e.g., logging in, setting up the accounts, uploading the materials, etc.), along with the teachers' and students' logs in the training sections, these logs were excluded leaving only the participants' teaching and learning practices in coursework. The log data was collected over one year (from Jan 11, 2019, to May 1, 2020), including a summer and a winter break. There are five main findings which can be seen throughout the Moodle logs:

(1) The participants engaged more in the formal courses than the informal courses;

(2) The students engaged more often than the teachers;

(3) Viewing more than producing;

(4) Tending to use a specific device throughout the period;

(5) A similar engagement between the teacher and students in Class D2.

Figure 23 *An example of Moodle logs in Microsoft Excel format*

	A	B	C	D	E	F	G	H	I
1	Time	User full name	Affected use	Event context	Component	Event name	Description	Origin	IP address
2				Course: 中国語圏	System	Course viewed	The user with id '178' viewe	ws	
3				Course: 中国語圏	System	Course viewed	The user with id '52' viewed	ws	
4				Course: 中国語圏	System	Course viewed	The user with id '52' viewed	ws	
5				Course: 中国語圏	System	Course viewed	The user with id '52' viewed	ws	
6				Course: 中国語圏	System	Course viewed	The user with id '67' viewed	ws	
7				Course: 中国語圏	System	Course viewed	The user with id '67' viewed	ws	
8				Course: 中国語圏	System	Course viewed	The user with id '47' viewed	ws	
9				Course: 中国語圏	System	Course viewed	The user with id '9' viewed t	web	
10				Quiz: 【クイズ】	Quiz	Course module viewed	The user with id '9' viewed t	web	
11				Course: 中国語圏	System	Course viewed	The user with id '9' viewed t	web	
12				Course: 中国語圏	System	Course viewed	The user with id '9' viewed t	web	
13				Forum: 【文】日	Forum	Course module viewed	The user with id '9' viewed t	web	
14				Course: 中国語圏	System	Course viewed	The user with id '9' viewed t	web	
15				URL: 【動画】北	System	Course activity completion updated	The user with id '9' updated	web	
16				URL: 【動画】北	System	Course activity completion updated	The user with id '9' updated	web	
17				URL: 【動画】北	URL	Course module viewed	The user with id '9' viewed t	web	
18				Course: 中国語圏	System	Course viewed	The user with id '9' viewed t	web	
19				Course: 中国語圏	System	Course viewed	The user with id '9' viewed t	web	
20				Forum: 【カラオ	Forum	Course module viewed	The user with id '9' viewed t	web	
21				Course: 中国語圏	System	Course viewed	The user with id '9' viewed t	web	
22				Forum: 【文】日	Forum	Course module viewed	The user with id '9' viewed t	web	
23				Forum: 【文】日	Forum	Course module viewed	The user with id '9' viewed t	web	
24				Forum: 【文】日	Forum	Course module viewed	The user with id '9' viewed t	web	
25				Course: 中国語圏	System	Course viewed	The user with id '9' viewed t	web	
26				Forum: 【観光に	Forum	Course module viewed	The user with id '9' viewed t	web	

Table 73 *Description of the Moodle log*

Attributes	Descriptions
Time	Start date and time of the event
User full name	Identified name of the event user
Affected user	Name of the event target
Event context	Marker of the event conducted
Component	Marker of event types in general
Event name	Event performed by the user
Description	Description of the event
Origin	The user access via website (web) or app (ws)
IP address	IP address accessed by the event user

(1) The participants engaged more in the formal courses than the informal courses

As categorized in **Chapter 3.4.1.2**, the materials in Moodle were designed as two types of courses: formal and informal. **Table 74** shows a large number of events (94% of 11,943) were recorded as formal courses. This means that the four classes used the materials related to their textbook through Moodle (formal courses) more frequently, compared with the supplements which were unrelated to their textbook in Moodle (informal courses). In formal courses (**Table 75**), it was found that Student #B4 completed a large number of events (60% of 289) of listening to the textbook audios. The same purpose of usage was found in the other students' logs as well. Since the unpublished textbook used in class was made by Teacher B without a CD format, the only method to review the texts was to access the audios through Moodle. Class C2's students used Moodle to review sub-textbook vocabulary and grammar (47% of 73) which the researcher edited in Quizlet format. Also, according to the logs in the informal courses (**Table 76**), the participants tended to use the contents related to vocabulary (29%), pronunciation (23%), grammar (19%), and culture (17%) with which they engaged more frequently.

Table 74 *Students' log counts in formal and informal courses*

	Class A2	Class B2	Class C2	Class D2	Total
Formal	0	347	73	10,778	11,198
Informal	11	108	179	447	745
Total	11	455	252	11,225	11,943

Table 75 *Log counts in formal courses (n= 46)*

Frequency	Class A2	Class B2	Class C2	Class D2
Teacher	0	0	0	2,355
Students	0	347	73	8,423

Table 76 *Log counts in informal courses (n = 43)*

Content	Vocabulary	Grammar	Pronunciation	Reading	Conversation	Culture	Total
#A1	0	0	0	0	0	5	5
#A2	0	1	5	0	0	0	6
#B1	0	0	0	3	0	0	3
#B3	0	0	4	0	0	0	4
#B4	8	1	16	2	4	57	88
#B6	0	0	1	0	0	0	1
#B7	0	0	0	0	0	2	2
#B8	0	0	5	0	0	0	5
#B9	0	0	3	0	0	0	3
#B10	2	0	0	0	0	0	2
#C1	25	53	3	12	0	1	94
#C2	2	23	0	7	6	0	38
#C3	3	2	16	7	0	0	28
#C4	2	15	0	1	1	0	19
#D1	1	0	1	1	1	3	7
#D3	0	0	7	0	0	2	9
#D4	39	0	1	0	0	0	40
#D5	1	0	0	0	0	0	1
#D6	6	0	0	0	0	0	6
#D7	1	0	7	0	0	1	9
#D8	0	0	0	0	1	0	1
#D10	2	0	0	0	1	0	3
#D11	3	0	0	0	4	4	11
#D12	2	0	0	0	1	0	3

#D13	0	4	2	0	0	0	6
#D14	14	1	22	2	5	0	44
#D15	2	0	0	0	0	0	2
#D16	6	0	4	1	0	0	11
#D17	3	0	0	0	0	0	3
#D18	0	0	4	0	0	0	4
#D19	21	14	4	0	1	0	40
#D20	2	0	5	0	2	0	9
#D21	1	2	0	0	0	0	3
#D22	12	0	0	0	0	0	12
#D24	0	0	0	0	1	0	1
#D25	3	0	6	0	0	0	9
#D26	6	0	0	2	2	3	13
#D28	4	1	0	0	0	1	6
#D29	7	0	0	0	0	1	8
#D30	0	5	8	0	1	0	14
#D31	1	0	1	0	0	0	2
#D34	3	0	2	0	0	0	5
Teacher D	33	17	42	24	2	47	165
Total	215	139	169	62	33	127	745

(2) The students engaged more often than the teachers

After the teacher training, Teacher A, Teacher B, and Teacher C did not have any engagement recorded. In contrast, Teacher D adopted Moodle in the formal class, who engaged actively in Moodle with 2,520 logs recorded. On the other hand,

Table 77 indicates that the Class B2 and Class C2's students engaged more often than their teacher, though Moodle was not adopted in their formal course.

Table 77 *Log counts in formal courses*

Frequency	Class A2	Class B2	Class C2	Class D2
Teacher	0	0	0	2,355

| Students | 0 | 347 | 73 | 8,423 |

Analyzing the students' engagement further, from **Table 78** we can see that one student in Class B2 was a heavy user, with over 251 activity logs recorded, while the other students in Class B2 and Class C2 (10 students) did not engage in Moodle as actively (below 100 times) as this particular student. Although Class D2 integrated Moodle in their class, it was found that the students had varied engagement instances. The majority of the students (38%) recorded 201 to 300 instances of activity logs. Seven (21%) of the students even engaged over 300 times.

Table 78 *Frequency count of students' Moodle logs*

Student	Class A2 (n = 13)	Class B2 (n = 31)	Class C2 (n = 27)	Class D2 (n = 34)
Frequency				
0	13	24	23	0
1~50	0	6	3	0
51~100	0	0	1	3
101~150	0	0	0	4
151~200	0	0	0	1
201~250	0	0	0	13
251~300	0	1	0	6
Above 301	0	0	0	7

(3) Viewing more than producing

Excluding the login and logout, each "event name" column in Moodle, which indicated what action the participants had accessed and performed, was recorded. The frequencies of the actions are summarized in

Table 79. The event names can be categorized as (1) viewing and (2) producing; the former means passively checking the contents while the latter refers to submitting and uploading the assignments. As can be seen, a large number of the events were marked

as "viewing" among the three classes. Though the researcher had designed some task-based activities in Moodle's informal courses, none of the students completed them. This shows that the students only did the required tasks that the teacher assigned.

Table 79 *Class engagement in Moodle (event name)*

	Class B2	Class C2	Class D2
Viewing (T = 7,477)			
Course activity completion	72	12	1,348
Course viewed	84	20	2,047
Course module viewed	146	27	2,593
Grade user report viewed	5	2	56
Step shown	5	0	28
Tour started	3	0	31
Tour ended	3	0	20
User list viewed	14	11	60
User profile viewed	15	1	63
Badge listing viewed	0	0	6
Submission form viewed	0	0	132
The status of submission	0	0	1,093
Producing (T = 945)			
File uploaded	0	0	189
Assignment submitted	0	0	189
Text uploaded	0	0	189
Submission created	0	0	288
Submission updated	0	0	90

(4) Tending to use a specific device throughout the period

Regarding how the teachers and the students engaged in Moodle, the methods they accessed with were marked as "origin" in the Moodle logs. Since there were no logs recorded from Class A2, the logs from the other three classes were analyzed by the users, as seen below in **Table 80**, **Table 81**, and **Table 82**. This suggests that the users in the three classes tended to use either the website or app throughout the period with

56% (26 users) out of 46 users, which shows that the users seemed to have their preferable device to engage in the online materials in different versions of Moodle. Also, since Teacher D did not have a smartphone, it was recorded that he used only the website with a total of 2,355 times; however, the students tended to use a smartphone (5,733 events) nearly two times more than the website (2,690 events).

Table 80 *Class B2's user log*

(n = 7)	web	ws (app)	Total
Student #B1	0	8	8
Student #B2	29	0	29
Student #B3	8	0	8
Student #B4	0	289	289
Student #B5	6	0	6
Student #B6	4	0	4
Student #B7	0	3	3
Total	47	300	347

Table 81 *Class C2's user log*

(n = 4)	web	ws (app)	Total
Student #C1	0	23	23
Student #C2	0	28	28
Student #C3	5	0	5
Student #C4	0	17	17
Total	5	68	73

Table 82 *Class D2's user log*

	web	ws (app)	Total
Teacher D	2,355	0	2,355

Students (n = 34)	web	ws (app)	Total
Student #D1	137	108	245
Student #D2	222	0	222

Student #D3	3	101	104
Student #D4	28	260	288
Student #D5	7	244	251
Student #D6	44	55	99
Student #D7	24	185	209
Student #D8	6	246	252
Student #D9	3	225	228
Student #D10	1	234	235
Student #D11	65	156	221
Student #D12	0	189	189
Student #D13	9	270	279
Student #D14	463	0	463
Student #D15	13	215	228
Student #D16	215	0	215
Student #D17	0	107	107
Student #D18	0	109	109
Student #D19	160	289	449
Student #D20	0	228	228
Student #D21	0	441	441
Student #D22	233	0	233
Student #D23	0	79	79
Student #D24	0	70	70
Student #D25	271	0	271
Student #D26	199	265	464
Student #D27	8	213	221
Student #D28	53	438	491
Student #D29	141	137	278
Student #D30	25	93	118
Student #D31	6	220	226
Student #D32	338	0	338
Student #D33	0	204	204
Student #D34	16	352	368
Total	2,690	5,733	8,423

(5) A similar engagement between the teacher and students in Class D

As Class D2 adopted Moodle in their formal class, the events Teacher D engaged in were related to "assignment" with 1,525 instances recorded (65% of 2,355). For

example, the teacher used it to download the assignments, as well as to grade and make comments. Also, since Teacher D presented the textbook's texts and audios through Moodle in the classes, the rest of the events were marked as "viewed" in the event descriptions. In addition to the textbook, Teacher D also displayed YouTube clips in the class with 26 events to introduce Chinese films, sightseeing spots, and Chinese songs through the YouTube URL inserted in Moodle. However, the teacher sometimes encountered technical difficulties when he tried to use Moodle, which will be discussed further in the following section (**Chapter 4.4.2** Classroom Observation). He then gave up the usage.

In a similar vein, as the teacher, the Class D2 students recorded a vast number of events, such as submitting assignments (3,731 events) and checking texts and audios (3,770 events), following by viewing vocabulary lists (518 events) and accessing YouTube links (209 events). Besides this, the materials which Teacher D had not used were accessed by the students. A small number of the students used a pinyin system (68 events) and viewed the animated stroke order of Chinese characters (63 events), which the researcher inserted into Moodle.

4.4.2   Classroom Observations

Moodle was implemented from the 2019 Spring semester (April 2019), and the students were registered by the researcher after the student training in the beginning of the semester. The four classes were observed to see if the teachers adopted Moodle in their teaching practices, however, Teacher C resisted being observed as he claimed that he was "*building relationships with the students*." Thus, only the first class with Class C2 was observed. Instead of the formal classes, Teacher C asked if the researcher could help with an informal pronunciation course, which was held during lunch break twice

a week. Thus, the pronunciation course was observed as well. **Table 83** and **Table 84** show the classroom contexts which were observed and summarized; we can see that Class A2 and Class B2 did not adopt Moodle or any of the online materials that the researcher had introduced. Also, the teaching practices did not have significant change compared with the previous semester (Fall 2018). The results are explained further by each class given below the tables.

Table 83 *Classroom observations (2019 Spring semester)*

2019 Spring	Class A2	Class B2	Class C2	Class D2
Students	13	31	27	33
Level	Intermediate	Beginner	Beginner	Beginner
Seating	Traditional	Traditional	Traditional	Traditional
ICT Equipment	PC, projectors, Wi-Fi, speaker, monitor, CD/DVD player			
Material(s) used	Printouts	Textbook, sub-textbook, self-made printouts	Textbook, sub-textbook, dictionary	Textbook, sub-textbook, printouts
Device(s) used	None	MP3 player	-	CD player, PC
LMS implementation	None	None	None	Yes
Smartphone banned	Not specified	Strictly banned	-	Not specified
Teacher's meta language(s)	Japanese	Chinese, Japanese	Japanese	Japanese
Teaching approach(es)	GTM	ALM, GTM	GTM	GTM
Content and focus	Grammar, translation	Pronunciation, grammar, translation	Pronunciation, vocabulary, grammar, translation	Vocabulary, grammar, translation, culture
Activities	Grammar instruction, textbook	Drills, recitation, grammar	-	Translation, recitation, shadowing,

	exercises, translation	instruction		listening, student presentations
Interaction	T-S	T-S	-	T-S
Weekly assessment(s)	None	Dictation test	-	Dictation test, recitation
Assignment	Short essay (handwriting)	None	-	Writing tasks, recording task

Table 84 *Classroom observations (2019 Fall semester)*

2019 Fall	Class A2	Class B2	Class C2	Class D2
Students				
Level	Intermediate	Beginner	Beginner	Beginner
Seating	Traditional	Traditional	Traditional	Traditional
ICT Equipment	PC, projectors, Wi-Fi, speaker, monitor, CD/DVD player			
Material(s) used	Printouts	Textbook, sub-textbook, self-made printouts	Textbook, sub-textbook, dictionary	Textbook, sub-textbook, printouts
Device(s) used	None	MP3 player	MP3 player	CD player, PC
LMS implementation	None	None	None	Yes
Smartphone banned	Not specified	Strictly banned	Strictly banned	Not specified
Teacher's meta language(s)	Japanese	Chinese, Japanese	Japanese	Japanese
Teaching approach(es)	GTM	ALM, GTM	GTM	GTM
Content and focus	Grammar, translation	Pronunciation, grammar, translation	Pronunciation, vocabulary, grammar, translation	Vocabulary, grammar, translation, culture
Activities	Grammar instruction, textbook exercise,	Drills, recitation, grammar instruction	Translation, recitation, shadowing, grammar	Translation, recitation, shadowing, listening

	translation		instruction	practice
Interaction	T-S, S-S	T-S	T-S	T-S
Weekly assessment(s)	None	Dictation test	Dictation test, recitation	Dictation test, recitation
Assignment	Short essay (handwriting)	None	None	Writing tasks, listening tasks

Class A2

According to Teacher A, Class A2 had two classes per week. One of the classes focused on reading and speaking skills, which the researcher had observed in the 2018 Fall semester, and the other class focused on writing skills which the researcher observed in the 2019 academic year; thus, the teaching practices in the two classes were quite different. In the 2019 Spring and Fall semesters, only printouts were used in class which were photocopied from a textbook published in China several years ago; according to Teacher A, it is now out of print. Regarding the teaching activities, it was found that the teacher had a fixed teaching routine, which was: (1) giving grammar instruction in the first 30 minutes, (2) doing the exercises from the printouts with the teacher and doing the translations (Japanese to Chinese) in the printouts, and (3) finally, the teacher checked the answers one-to-one. It was also found that when doing the translations, the students used their electronic dictionary, smartphone, tablet, and laptop to look up the word meanings. Besides this, in the two semesters, Teacher A did not use any of the devices or "technologies" in class which she stated she had used on the teacher survey.

Class B2

While Moodle was not adopted in Class B2, Teacher B started to use a PC in class in the 2019 Spring semester. In a total of 12 classes that the researcher observed for Class B2, Teacher B used a PC in four of those (30%). It was observed that he used Google

Maps and graphs to teach grammar points (existence and possession) related to the self-made textbook. For example, Teacher B used the maps to present the direction of a campus and practice drills with the students and dragged the map to demonstrate "going straight" physically. However, in the rest of the teaching practices (the 2019 Spring semester and the 2019 Fall semester), no specific differences were found from the 2018 Fall semester in which only the MP3 player was used in class. Also, it was found that Teacher B tended to have the same teaching routine as Teacher A, which was: (1) asking the students to stand up and read the vocabulary list and texts on the printouts several times, (2) giving grammar instructions based on the textbook, (3) giving a dictation test, in which the teacher read phrases in Chinese, and the students wrote down the Chinese characters and pinyin, as well as the translations in Japanese.

Class C2

While only one of Class C2's classes was observed in the 2019 Spring semester, the syllabus indicated the materials used and teaching focus remained the same; also, the class did not adopt Moodle which can be observed from the Moodle logs. In Teacher C's pronunciation course, the teacher played video clips produced by NHK, a television program that targets self-learners, to let the students listen to the Chinese phrases, and then paused it to correct the students' pronunciation one-to-one. The teaching process was similar to the teaching strategies that Teacher C used in the formal course in the 2018 Fall semester, only the materials were different (from textbook audios to video clips).

In the 2019 Fall semester, Teacher C agreed to be observed; however, the teaching practices were found not to be particularly different from the 2018 Fall semester, as the classroom activities and teaching approaches remained the same. Also, Teacher C asked

the researcher to help him read the texts in class as part of the teaching routine, which was: (1) playing the sub-textbook's audios through an MP3 player and asking the students to read the texts after the researcher, (2) teaching grammar by explicit instructions and asking the students to translate the example sentences he'd made from Japanese to Chinese, (3) giving a recitation test based on the textbook in pairs and individually.

Class D2

Class D2 was the only class that adopted Moodle in the formal course for in-class teaching and outside of class learning. The usages and technical problems in Class D2 were found to be as follows:

(1) Moodle and online materials used in and outside of class

As observed in Class D2, Teacher D used a PC relatively frequently in class compared with the other three teachers, with 69% of 13 classes in the 2019 Spring semester and 75% of 12 classes in the 2019 Fall semester. Teacher D used the PC mainly for presenting the digitalized textbook through Moodle and displaying songs and videos on YouTube. Since the textbook had glossed pinyin behind the Chinese character, the teacher found that the students might rely on the pinyin and be unable to read the texts without it. Thus, he thought the digitalized texts on Moodle without pinyin were useful and projected the texts when teaching in class.

Furthermore, unlike the other three teachers, Teacher D tended to teach more flexibly without the same teaching routine and adopted more materials and activities in class. He used YouTube to teach Chinese songs and play films to teach Chinese culture. In the 2019 Spring semester, Teacher D asked the students to do a presentation based on

the given topics with Microsoft PowerPoint by the end of the semester. Before the presentation, Teacher D asked the students to submit the scripts through Moodle; however, he printed them out and asked the researcher to double-check the scripts he had corrected as he claimed that "*I am not confident with correcting their writings, because I am not a native (Chinese).*" The teacher's lack of confidence can also be found when the students were presenting their works. For example, when seeing some of the students present their slides with animations and fabulous designs, the teacher said he did not know how to use those kinds of functions and said "*They are better at technology. I don't even have a smartphone.*" The teacher's personality can be observed when using the devices as well. When he saw that the students spent too much time setting up their slides on the PC, he said "*You spent too much time. I'm impatient. I can't wait. We don't have much time.*" While the researcher suggested letting the students set up their PowerPoint before the class, Teacher D responded that "*They depend on me a lot.*"

Aside from using Moodle and the online materials in the classes, Teacher D assigned tasks for out-of-class teaching as well. **Table 85** summarizes the assignments and the evaluation methods the teacher provided. As can be seen, there were five assignments given to the students in the 2019 Spring semester, including a summer break. However, only one assignment was provided in the 2019 Fall semester, which might be because Teacher D claimed that he was too busy to write manuscripts to publish and that he also had a conference to attend. This shows that assigning tasks and providing feedback through Moodle might take Teacher D a lot of time, so he reduced the usage when he had more important work to do.

Table 85 *Assignments on Moodle*

Assignment	Description	Evaluation
2019 Spring semester		
Assignment 1	Make at least six sentences based on the guidance and a map.	Teacher D provided feedback comments through Moodle and printed out the best works and read them in class.
Assignment 2	Listen to the audio and answer the following five questions.	Since many students claimed the assignment was too difficult, the teacher did not provide feedback on Moodle but completed it with the students in the class.
Assignment 3	Write a short essay to introduce your family from a cat's perspective.	Teacher D commented on the essays through Moodle and printed all the essays out and corrected them with the students in class.
Assignment 4	Write a presentation script (minimum of 200 words) based on one of the provided topics.	Teacher D provided comments through Moodle and printed them out to ask the researcher to correct them. After double-checking, he distributed to the students through printed copies.
Assignment 5 (Summer break)	(Optional) Read aloud one of the lessons from the textbook and record your voice.	Only four students submitted the optional assignment and Teacher D had difficulties opening the various audio formats; thus, he did not provide feedback.
2019 Fall semester		
Assignment 1	Watch the video clip and write a review of the film in Japanese.	Since the task was completed in Japanese, Teacher D did not comment on the task, but he thought he knew more about the students by reading their works.
Assignment 2	(Optional) Listen to the mp3 files	Teacher D provided working sheets and played the mp3 in the classroom and asked the students to preview and review the mp3 audios before/after class.

(2) Technical problems

In one of the classes, several technical issues occurred, and Teacher D called the technical supporters in the college for help twice when the speaker and projector did

not work well. The reason why the researcher did not help actively was to see what the teacher would do and to see if he would ask the researcher or the students for help. However, it was found that when the teacher encountered technical problems, he tended to solve them by himself rather than asking for help from the class. At the same time, none of the students stood up to help the teacher. Thus, Teacher D called the technical centre or gave up using the PC when he had difficulties again. Also, although the researcher told Teacher D how to adjust the font size when projecting Moodle's text on the screen, he sometimes forgot how to do so. Under those circumstances, the researcher would help in order not to interrupt the lesson.

Moreover, the concerns were more about the contents than the technical problems. Teacher D tried to use Quizlet, which the researcher introduced to the class, but he found it difficult to use. Since the features of homographs are used in Chinese and Japanese, the researcher made the flashcards in Quizlet with Chinese vocabulary on one side and the homograph on the other side. However, the teacher preferred to have Japanese translations on the other side; besides, he found the advertisements that popped up in Quizlet annoying. Instead of overcoming the barriers of using Quizlet, Teacher D used PowerPoint to replace it, as he stated that "*I know it is better for me to learn how to use Quizlet. I don't know how to use it, so I used PPT.*" This might indicate that when encountering technical problems, the teacher tended to use the methods he was familiar with rather than learning new methods.

Chapter 5.   Discussion

In the previous chapter (Chapter 4), the raw data was analyzed and presented by each

research instrument, respectively. This chapter merges the results gathered from qualitative (surveys and Moodle logs) and quantitative data (classroom observations, formal and informal interviews, as well as documents and field notes). Key findings are grouped thematically and discussed by the research questions. The first section (**5.1** Technology change and resistance) focuses on how the teachers and students adopted or resisted the Moodle and online materials used in the CFL educational environment. The following section (**5.2** Teacher perception and factor of adopting technology for teaching) concludes how the four teachers perceived educational technology integration into the CFL classrooms, and further discusses the factors that influenced their adoption/resistance to technology. Finally, the last section (**5.3** Student perception and factor of engaging learning with technology) summarizes the students' perception around educational technology that made an impact on their CFL learning engagement.

5.1 Technology change and resistance

Based on the data collected through classroom observations conducted before and after introducing Moodle and the online resources, the comparison of the teaching contexts in the four teachers' classrooms indicated that there were slight changes. The differences after the training session with the four teachers, in which Moodle and some online resources were introduced, can be seen as their adoption of new technology. Also, Moodle logs were analyzed to identify how the teachers and their students use the online materials and Moodle. The main findings, discussed separately in terms of teachers' and students' adoption of new technology, are summarized below.

5.1.1 Teachers' category of adoption

The teachers' adoption process of Moodle can be put into Rogers's (2003) five

categories of adopters. As it had been observed through the Moodle logs, Teacher A, Teacher B, and Teacher C did not use Moodle after the training session. Thus, they can be seen as *laggards*, who "tend to be suspicious of innovations and change agents" (Rogers, 2003, p. 265). They can even be seen as *nonadopters*, who seemed to be reluctant to change the current teaching method with the use of new technology. Unlike other teachers, Teacher D adopted Moodle right after it was introduced from the second semester, thus, he can be seen as an *early adopter*. In some ways, this study did not support Rogers's (2003) definition of the adopter categories. For example, Rogers (2003) identifies that a person who is younger and/or has higher social class and more financial resources is more likely to adopt innovative technology. However, in this study, the four teachers were similar in age and were all university faculty, which means that they shared similar social background and income. Moreover, this study also suggests that gender does not significantly influence technology adoption. In the UTAUT model, gender has been seen as one of the variables affecting technology acceptance. Similarly, Venkatesh et al. (2000) found that women and men were different from the decision-making processes of technology adoption. Apparently, neither age, education, social class, financial income, nor the gender differences could determine the adoption of educational technology.

In terms of Rogers's (2003) five-stages of the innovation adoption process, the *laggards* stopped at the first stage. That is to say, Teacher A, Teacher B, and Teacher C were in the *knowledge* stage, where they received information about Moodle and the online resources new to them, but they did not move through the next stage (i.e., *persuasion*) to seek more information. On the other hand, Teacher D moved through the five stages that are consistent with Rogers' five-stages. As observed through the Moodle logs and in Teacher D's classrooms, the processes of how he adopted Moodle are summarized in

the table below:

Table 86 *Teacher D's stages of Moodle adoption*

Stage	Description
1. Knowledge	Receiving information about Moodle in the training session but having little knowledge about it in the end.
2. Persuasion	Shaping his own individual attitude toward Moodle and starting to find more information by asking the researcher for advice.
3. Decision	Deciding to adopt Moodle from the 2019 Spring Semester.
4. Implementation	Applying Moodle in his class and assigning homework through Moodle. Asking the researcher to upload the materials into Moodle for him.
5. Conformation	Sustaining the Moodle use in the 2019 Fall Semester.

Note that though Teacher D implemented Moodle in his teaching practices after the introduction, how he utilized it was more important. In the following sections, I will discuss to what extent the teachers changed their teaching methods after Moodle was introduced.

5.1.2 Teaching materials and devices use

By comparing the results of classroom observation gathered before and after Moodle and online resources were introduced (see the comparison among **Table 29**, **Table 83,** and **Table 84)**, we can see how the four teachers changed/maintained their existing teaching across the time within the three semesters (2018 Fall to 2019 Fall). The four teachers did not make significant changes in their teaching materials and device use

after the training in utilizing Moodle and online resources. It is assumed that physical barriers, including a lack of internet access and insufficient technical equipment, had been removed in these contexts. Not only did the researcher provide technical support in the classrooms, but also a technical support team was available at the university. The teachers were free to call the support team in the classroom if they encountered technical problems. As such, these extrinsic barriers that Ertmer (1999) notes were removed from the teaching environment. Even though all the classrooms were provided with basic ICT equipment (i.e., PC, projector, Wi-Fi, speaker, monitor, CD/DVD player), the teachers used the certain device(s) they were familiar with. For instance, Teacher B and Teacher C mainly used a MP3 player in every class, and Teacher D used a laptop and a CD player equipped in the classroom. As observed in Class A1 and Class A2, Teacher A did not use any device in her classroom across the three semesters. These findings indicate that the teachers tended to adopt the technologies they had been using for learning a language, and there is a tendency that the teachers sustained their teaching methods that rarely changed.

In terms of teaching/learning materials used in the classrooms, it was found that all the teachers preferred paper-based materials. For example, Teacher A assigned a weekly writing task, asking the students to write articles in Chinese through handwriting. The teacher marked the writing task with a red pen and then returned it to the students in the classroom. Though these processes could simply be completed through Moodle, Teacher A did not adopt it. As she raised her concerns about typing, she believed that the students learn better through handwriting with which they could memorize how to write simplified Chinese characters. On the other hand, Teacher D also assigned writing tasks for the students but adopted Moodle in a "blended" way. That is, he asked the students to write an article through typing and upload it to Moodle. However, the

teacher downloaded the assignments and printed them out to mark the articles. He provided feedback on grammar used and word choices through Moodle, for example, *"It seems that you understand the grammar very well. You have done a good job in writing,"* or simply a confirmation: *"I have checked it."* However, the teacher corrected the printouts of the articles with students in the classroom. It might be because he felt more comfortable with the paper-based ways he had been using. The preference for paper-based materials seemed difficult to be changed in the four teachers' classrooms (see also Wang, 2021). Textbooks and printouts were widely used in their teaching. In particular, Teacher A, Teacher B, and Teacher C suggested bringing a dictionary to the class to their students.

5.1.3 Teaching styles and classroom management

The findings reveal that the four teachers generally maintained their teaching styles and the ways of managing their classrooms in the same way after new technology was introduced and implemented. The teachers mainly used GTM and ALM in the classrooms, where they played the role as *formal authority* (Grasha, 1996). That is, the teachers explained grammar and word meaning in Japanese, and practiced Chinese through drills, recitation, and translation. The teachers did most of the talking in the classrooms without peer activities and group activities. The one-way interaction and teaching approaches in their classroom can be identified as teacher-centered teaching styles. As Teacher A claimed, it was common to teach language as a subject in order to pass examinations at Japanese universities, thus, "*teachers prefer to teach like a cram school (juku) does*." That is, language education is seen as a subject to prepare for examinations, with which the teaching emphasis is placed on helping students to get high scores or to get the required credits rather than to achieve practical language knowledge. Therefore, these teacher-centered approaches were not easy to change for

the experienced teachers.

As suggested by Barrett et al. (2007), the findings in this study also indicate that though the teachers adopted new technology, their teaching styles remained teacher-centered. These values correlate favorably with Warschauer's (1996) *structural CALL* and further support the idea of Bax's (2003) *restricted CALL*. Although we are in the 21st century where various Web 2.0 tools are available, the teachers tended to choose the "old technologies" that they were familiar with. For instance, video cassettes, mp3 players, and electronic dictionaries were frequently used in the teachers' classrooms to practice pronunciation with the students. The focus on accuracy and GTM as well as ALM in their classroom can be seen as the *structural CALL*. Obviously, their usages were far from Bax's (2003) *normalized CALL*. Although computers were equipped in every classroom, the teachers rarely used it in every lesson. According to the teachers' requirements for the online materials that they wanted to develop through Moodle, it was found that the teachers generally viewed the online materials as additional contents (e.g., Chinese culture and reading materials irrelevant to the formal class). Although the teachers were suggested using authentic materials and task-based approaches with the use of online resources and Moodle (e.g., making videos, making animation, ordering food in Chinese) in the training sessions, they did not take the advice.

In terms of classroom management, the teachers did not take advantage of the new technology. For instance, in the training workshop, the teachers were suggested using Moodle to manage students' attendance and engagement, but they still preferred calling the roll with a roll book in the classrooms. Also, they preferred evaluating the students' learning achievement through traditional assessment (i.e., pen-and-paper test). In Teacher A's, Teacher B's, and Teacher C's classrooms, the researcher observed that they

had their own teaching routine (e.g., calling the roll, explaining grammar and vocabulary, doing drills and practices, and then taking quiz), and they had used the same teaching materials for several years. This can explain why they hardly adopted new methods which may interrupt the teaching patterns that they had established for years. On the contrary, Teacher D seemed to have a more flexible teaching routine, which was observed across the three semesters. For instance, Teacher D claimed that he changed textbooks in his classes regularly because he wanted to try different textbooks every semester. Also, as Teacher D claimed in the small talk: *"I am a spontaneous person.,"* he did not have a teaching routine like the other teachers had. It seems that Teacher D was more open-minded to try new teaching methods compared with the other three teachers.

Moreover, as can be seen in the results section: **Banning devices in class**, Teacher B and Teacher C banned using a smartphone to look for words not only in their classrooms but also outside of the classrooms because they viewed it difficult to take control over students' learning and they thought there is a lack of *"accurate"* content in smartphone-based dictionaries. On the other hand, Teacher A allowed smartphone use with restrictions since she required the students to complete translation tasks in the class, but she shared the same concerns with the two teachers. In case that the students would learn "wrong Chinese language" from online resources, she recommended her students to use a certain online dictionary. Holding a different perspective from the three teachers mentioned above, Teacher D did not ban smartphones or other devices used in the classroom. These classroom management methods show that the teachers had their own concerns and preferences of using/not using a certain technology for Chinese teaching.

5.1.3 Students' engagement in Moodle

As mentioned in the previous chapter (Chapter 4), the students' Moodle logs were recorded and observed to analyze their engagement and learning patterns. The results show that the students' engagement in the four classes varied. It is obvious that the students' technology adoptions were affected by the teachers. For instance, if the teacher required the students to complete an assignment through Moodle, the students might not have the right to reject it. Thus, in this section, how the students used Moodle will be discussed separately in the four classes, which had been observed from 2019 Spring semester to 2019 Fall semester:

(1) Class A2

Since Teacher A had not used Moodle and any online materials after the training session, she did not require her students to use it. As a consequence, only a total of eleven students' Moodle logs were recorded after the in-class training in Moodle use. Although the researcher provided grammar materials for the students to practice, which Teacher A thought might be helpful, the students did not log in to check them. The students were advanced learners who had been learning Chinese for about five years, however, it seems that they followed only what the teacher requested them to do. That is, they merely completed the assignment outside of the classroom that mattered for their course scores and credits. The lack of learning motivation might result in 100% *non-adopters* (two students' event count was below 10 times) in Class A2.

(2) Class B2

As the results chapter has shown, in Class B2, Teacher B did not use Moodle after the training session. A total of 455 times of activity logs were all contributed by the students.

It was recorded that six out of the 31 students (19.3%) had tried to use Moodle within 50 times and one student (0.3%) was a *heavy user* with 251 activity logs recorded. The activity logs show that the students mainly used Moodle to view Teacher B's digitized self-made materials. As the teacher had requested, the researcher recorded the materials in an audio format for the teacher and uploaded them to Moodle. Thus, the students were able to practice the pronunciation with the audio files through Moodle, which were not available anywhere else. However, Teacher B did not promote the usage of the audios in his class, thus, not many students knew that the materials were available on Moodle. Only the students who had tried to use Moodle found that the materials were useful and further sustained the usage. Therefore, the lack of promotion might have caused low learning engagement with Moodle (77.4% *non-adopters*) in Class B2.

(3) Class C2

As the Moodle logs presented in the results chapter, the students engaged in Moodle in Class C2 were less than those in Class B2. Merely a total of 252 activity logs were recorded in Class C2. It was found that after the in-class training session where Moodle was introduced, only four of the students (14.8%) logged in to Moodle. The students mainly engaged in the contents about vocabulary (Quizlet) and grammar (an existing website) that related to their supplemental textbook. According to the categories of users mentioned previously, a majority (85.1%) of the students were *non-adopters*. Whereas, although Teacher B did not adopt Moodle and did not require the students to use it, the students who were interested in the contents were motivated to review the vocabulary and grammar learning materials through Moodle.

(4) Class D2

Since Teacher D implemented Moodle in the class and assigned tasks through it, it is

not surprising that the students in Class D2 reached a total of 11,198 log counts. As the students' activity logs have shown, most of them used Moodle for submitting assignments (3,731 counts), as well as checking texts and audios (3,770 counts). In addition to the contents related to the formal courses, the students also engaged in the contents that were irrelevant to the formal courses. Even though the teacher did not ask the students to engage in the informal courses that the researcher had provided for them, 447 activity logs were recorded. This shows that the students' learning motivation might be facilitated because they viewed the materials autonomously without the teacher's requirement. On the other hand, the students might incidentally view the contents while completing the required assignments.

In summary, the findings suggest that the students engaged far more often in Moodle than their teachers. Teacher A, Teacher B, and Teacher C did not adopt Moodle and had not even logged in to Moodle after the training session; however, their students had tried to use Moodle even though their teachers did not ask them to use it. It was also found that the students tended to engage in the learning materials when they perceived the language aspects of the materials (e.g., vocabulary and grammar) were important. Moreover, the students rarely sustained their usage without the teachers' requirement. That is, the majority of the students only used Moodle when the teachers required them to use it, and this is the reason that the students in Class A2, Class B2, and Class C2 were mainly *non-adopters* of Moodle and the online materials. The originality of the materials seemed to determine the students' willingness to sustain the usage of Moodle. According to a student in Class D2: *"If we have to open a YouTube link through Moodle, why don't we just simply open the YouTube page and skip the login process in Moodle?"* As such, if students are able to find the existing resources/materials elsewhere, they may not use Moodle, which can be seen as an unnecessary tool needing redundant

processes.

5.1.4 Learning style and learning strategy

As has been discussed previously, the students tended to engage in vocabulary tasks and grammar tasks through Moodle more than other materials. The Moodle logs indicate that the students viewed the contents (7,477 times) in Moodle more often than produced contents (945 times). These logs imply that the learners might be visual learners with a diverging learning style (Kolb, 1984, 1999), who preferred watching and receiving knowledge. The tendency to engage in vocabulary tasks through Quizlet might also show that the students preferred learning vocabulary through translation. This finding is consistent with Yoon and Jo's (2014) study that found the students tended to use cognitive strategies for using the online materials, that is, translation and repetition. The students' preference for learning Chinese with Japanese translation was in compliance with the method that they were taught in the classrooms. These findings show that the students adopted the online materials through Moodle according to their learning preferences, which might match with their teacher's teaching styles.

Moreover, the device(s) the students used to access Moodle was recorded in the Moodle logs to see if the students used the website or the mobile application version of Moodle. The results suggest that the students tended to use the certain device across the time. That is, the students who adopt the website from the beginning would sustain the usage and rarely switch to the application, and vice-versa. This indicates that the habitual and preferred way the students perceive plays a crucial role in their learning styles (see also Dörnyei, 2005) that further affect their technology choices. The activities logs help to understand how the students use the online materials through Moodle, and further help

to check students' tendency to learn Chinese outside of the classroom. Although Moodle can keep the records if the students clicked the link to access Quizlet, unfortunately, the students' usage patterns of Quizlet were not recorded in this study. Quizlet requires all students to register an account to keep the records, but the students did not do so. Therefore, how the students used the Quizlet is unclear.

5.2 Teacher perception and factor of adopting technology for teaching

To understand what factors may affect in-service teachers' decisions in adopting new technology into their teaching, in this study, the four CFL teachers were asked about their perceptions through both formal and informal interviews. Also, a self-reported questionnaire was conducted to understand how the teachers perceived integrating educational technology into their teaching practices. This section presents findings merged from the data collected through the teachers' pilot survey, interview transcripts, along with the field notes recorded in the workshop, meetings, emails, and small talks. As has been mentioned in the methodology chapter (Chapter 3), the qualitative data and quantitative data were analyzed separately, then merged together through thematic coding. These findings were divided into two sections: (1) the teachers' personal perceptions and (2) the teachers' perceptions that associated with others' perceptions, in order to address RQ2 and the sub-questions below:

RQ 2. What factors influence the teachers' decisions in technology integration?

2.a What are the teachers' perceptions of integrating technology into CFL courses?

2.b What other factors affect teachers' implementation of educational technology?

5.2.1 Personal perceptions

The findings were thematically coded based on Expectancy-Value Theory (EVT) (Eccles et al., 1983; Wigfield & Eccles, 2000). Regarding the teachers' personal perceptions that affected their decisions of integrating educational technology into CFL courses, the main findings are summarized in the following table (see **Table 87**), and the findings are discussed further by the categories and subcategories in the following sections.

Table 87 *Factors affecting teachers' educational technology adoption and usage*

Theme	Category		Subcategory
Expectancy	(1) Experience	a.	Experience of using technology for teaching/learning
		b.	CFL learning experience
		c.	Teacher training
	(2) Knowledge	d.	CALL skills
		e.	Language knowledge
Value	(3) Attainment value	f.	Work priority
		g.	Importance for current teaching
	(4) Intrinsic value	h.	Interested in teaching through technology
	(5) Utility value	i.	Usefulness of technology
	(6) Cost	j.	Perceived high effort: time, financial constraints and large class size
		k.	Negative emotions: anxiety and stress
Other factors	(7) Sociocultural	l.	Hierarchy

	milieu	m. Group-oriented culture
		n. Perceived the other teachers' motivation
(8) Institutional milieu		o. External stimulus
		p. Support
(9) Perceived students' motivation		q. Perceived students' motivation of CFL learning
		r. Perceived the role of teachers and students

5.2.1.1 Expectancy

According to EVT, expectancy refers to an individual's beliefs regarding their success on a certain goal. In line with the theory, this study found that the teachers' prior experience and skills shaped their perceptions around new educational technology.

(1) Experience

a. Experience of using technology for teaching and learning

Both negative experience and positive experience made an impact on the teachers' decision-making processes to use Moodle and the online teaching/learning materials. In this study, it was found that the teachers who had negative experience with using technology for teaching before tended to be more reluctant to adopt new technology. For instance, Teacher A and Teacher B had used the X System in their previous department. In the individual interviews, they revealed that the system was not designed well, with which they lost their control over students' learning. Teacher B addressed that "*teachers become simply a manager*," and Teacher A claimed that *"We were disappointed with the system, so we have no expectations about it [Moodle] now."* Although the X System they were not satisfied with was totally different from Moodle, the teachers' negative impression of "old technology" might prevent them from giving

it a try. That is, their previous experience of what "technology" is might affect their expectation of new technology.

On the other hand, a positive experience of using technology may facilitate teacher's willingness to try new teaching methods with technology in the future. In the group meeting before the research was conducted, Teacher B shared his experience that he had taught with smartphones, with which he asked the students to take videos to introduce the campus in Chinese few years ago. In the individual interview, Teacher B revealed that *"The idea was copied from my English teacher."* Since he found his English learning experience with a smartphone was useful, he adopted the same methods to his Chinese teaching.

From the above examples, it can be assumed that negative experiences of teaching with technology may affect the teachers' expectations of new technology they have not tried. Meanwhile, positive experiences of learning with technology may influence the teachers' technology choice, in particular, there was a tendency that replicated the successful usage they had previously experienced.

b. CFL learning experience

Since Teacher B, Teacher C, and Teacher D were not native speakers of Chinese, they had been learning Chinese for several years. In the pilot survey, the teachers were asked if they had the experience of using technologies for learning Chinese. Although Teacher C and Teacher D answered "yes," the "technology" they referred to was quite out-of-date, for example, CDs, video cassettes, and electronic dictionaries. It might be because the time they learned Chinese was about 25 years ago. We can see how their previous learning experience affected their technology choices in the present teaching practices.

In other words, the teachers tended to sustain their use of a certain technology for teaching Chinese. Even though there were various online resources available, the teachers chose the materials they had used before. How the teachers chose their teaching materials was also affected by their previous CFL learning experience. For example, Teacher C used NHK's video clips in his pronunciation class as a language model to correct the students' pronunciation. According to Teacher C, he listened to the radio that NHK broadcasted to learn Chinese in his student life. As can be seen from the data collected in the classrooms, similarly, Teacher B used the printouts and mp3 audios to teach the students to recite the texts. When being asked about the source of the printouts and mp3 audios, Teacher B replied that those materials were photocopied from the Chinese textbook he had used to learn Chinese. Regarding the materials utilized for learning foreign languages, in the interview, Teacher B noted that:

We used to use a dictionary before. For example, we read English articles with a dictionary in class. If we don't use a dictionary, we can't understand the meaning.

Thus, we can see how Teacher B's English learning experience affected his Chinese teaching, as he encouraged his students to use paper-based dictionaries that he had learned with. The similar choices for teaching materials could be found in Teacher C's and Teacher D's class as well. From the classroom observations, it was found that Teacher C also encouraged his students to use paper-based dictionaries, and Teacher D photocopied the textbook, which they used to learn with. It is likely that when the teachers were making decisions in choosing teaching materials and educational technology, they tended to select the one they had used to learn with previously, which they found useful or were familiar with.

c. Experience of teacher training

According to the demographic data reported in the pilot survey, the four teachers were quite experienced in teaching CFL (Teacher A: 13 years, Teacher B: 20 years, Teacher C: 15 years, and Teacher D: 15 years). However, the individual interviews with the teachers indicated that though they had an average teaching experience of over 15 years, they had not received teacher training to teach CFL before. Teacher A, a Chinese native speaker, claimed that she taught with her classroom practices and was teaching as a part-time lecturer at a few universities before. Apart from classroom practices, the other teachers generally taught CFL in the ways they had been taught. In the interview, Teacher B, who had the most extensive teaching experience, stated, *"The contents (of self-made printouts) are my original ideas, but the teaching methods are from my Chinese learning experience."* He also said that the recitation activities undertaken in the classrooms were replicated from his learning experiences when he studied abroad in China. These findings indicate that the four experienced in-service CFL teachers tended to teach from their own practical experiences and CFL learning experiences rather than from formal education training. Thus, the lack of training in second language teaching and learning may influence their technology choices, as they tended to adopt structural CALL to practice drills (e.g., using mp3 audios and video clips to correct pronunciation).

The lack of experience of receiving technical training in their workplace might hinder the teachers' usage as well. As mentioned in the literature review chapter (Chapter 2), Japanese government has been promoting trainee teachers to take compulsory courses as part of educational technology training (i.e., the required credits to complete the course Operation of Information Technology) to receive teacher license to teach at schools since 2000. However, the teachers in this study graduated from university

before 2000, and they did not have to receive any teaching qualification to teach at university level in Japan. In other words, it was not necessary for the teachers to receive training to use educational technology when they became a language teacher at a Japanese university. Therefore, with a lack of training in technology from formal education, the teachers had to acquire digital skills in their workplace. According to the teachers who responded in the interviews, yet, they had not received sufficient technical training at the current university. As mentioned previously in the Results chapter (Chapter 4), though the university had an existing LMS at the time and was planning to adopt Moodle in the following academic year when this research was conducted, it was found that the teachers had limited knowledge of the existing LMS, so they mainly used it for making course announcements (e.g., class cancellation). Thus, the researcher asked the teachers if they had received training in using the LMS and Moodle from the university. According to Teacher B, the university merely told them *"Please use it (the existing LMS)."* Teacher C addressed that:

> *After the weekly meeting with the professors [working in the department], the staff introduced Moodle to us and distributed a manual with instructions. I know how to use the basic functions, probably, but I am still not familiar with it. I have tried things like Moodle, but got stuck with the usage…Moreover, how to utilize it upon the basic usage, and how to utilize it in my teaching…these are the teachers' responsibilities.*

In line with Stockwell's findings (2009), the observations in this study also showed that with a lack of training in language teaching and technology in such teaching contexts, the responsibilities of learning how to use CALL fall upon the teachers' shoulders.

(2) Knowledge

d. CALL skills

According to Hampel and Stickler's (2005) skills pyramid, basic ICT competence is the fundamental level of CALL training for teachers. However, the four teachers lacked technical training and varied in digital skills. In the self-reported questionnaire, Teacher A and Teacher B rated highest confidence in digital skills, as they rated 4 points (agree) on the 5-point Likert scale's item (Q1: I am confident with my technological skills) but did not adopt Moodle nor any new technology in their classrooms. These results are consistent with Kessler and Plakans's findings (2008), which found that the teachers with the highest confidence were less likely to use technology in their teaching practices. On the other hand, Teacher C rated less confidence in his digital skills (2 points: disagree) but made a little change in his teaching practices as he tried to use video clips to correct students' pronunciation in his pronunciation class. In line with Kessler and Plakans (2008) study, Teacher D rated moderate confidence but integrated more online materials (e.g., Moodle, Quizlet, YouTube) into his teaching practices.

In terms of practical digital skills, it was observed in the workshop and classrooms that the four teachers' computer skills varied. For example, in the workshop, when the teachers were asked to change the passwords of the registered Moodle account, the teachers behaved in different ways. Teacher A and Teacher B seemed to have no problem with the processes as they were able to change their passwords by themselves. However, Teacher C and Teacher D had to follow the researcher's step-by-step guidance. Moreover, it was observed that Teacher C typed with his two fingers, and Teacher D did not know the right place to type the Moodle website address. The two teachers spent more time on setting up the Moodle account compared with Teacher A and Teacher B. Unfortunately, Teacher A, Teacher B, and Teacher C did not adopt Moodle into their

teaching, so it was unlikely for the researcher to see how they use the functions. As has been discussed in the previous chapter (Chapter 4 Results), Teacher D adopted Moodle with limited usage. Although the researcher was willing to provide more training in the use of Moodle, Teacher D would rather send the researcher emails to upload the materials to Moodle for him. It might be because of Teacher D's lack of digital skills, as he claimed that he was afraid to destroy the system.

According to the American Library Association (ALA) (2013, p. 2), digital literacy refers to "the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills." Not only the teachers' lack of technical skills but also the lack of competence of searching and developing appropriate materials for the students were found in this study. When the researcher was demonstrating how to integrate technology into teaching and introduced various online Chinese learning resources, the teachers kept asking *"Where did you find it?" "Where did you know it?,"* even the researcher simply presented video clips through YouTube. It seems that the teachers did not know how to find existing online learning resources for teaching. From the results gathered from the teacher pilot survey, it was found that the four teachers responded diversely to the item regarding finding and evaluating online resources (Q13: I know how to select appropriate online materials for teaching and learning.) (M = 3.25; SD = 0.96). The small sample size might lead to the higher variability, and thus, follow-up interviews were conducted to understand how the teachers perceived their CALL skills. According to Teacher B, *"too many choices"* is the major factor that confuses teachers with selection of technology. Although Teacher D had tried using more new technology compared with the other teachers, he revealed that *"I don't know what to do. I'm not a linguistics expert." "If you (the researcher) have any good ideas, please tell me."* The

findings above indicate that there are numerous online resources available everywhere, but the ability to evaluate which one is appropriate for teaching/learning and to utilize it relies on teachers' CALL knowledge in terms of digital skills and teaching skills.

e. Language knowledge

The debate on whether a language teacher should be a native speaker, or a non-native speaker has been discussed in literature for a long time (Cook, 2008). However, the issue is rare in literature regarding teachers' CALL adoption. In this study, it was found that the native Chinese teacher and non-native Chinese teachers did have different perceptions of educational technology integration. Non-native teachers (i.e., Teacher B, Teacher C, and Teacher D) were more concerned about their Chinese language proficiency which affected their adoptions and usage. For example, Teacher B asked the researcher to record audios for his self-made materials. As he perceived his Chinese pronunciation was "imperfect," after one of the classroom observations, he claimed that *"I went to a conference, and the Chinese people there told me that I have Japanese accent."* Teacher B thought his non-native Chinese pronunciation might not be a good language model for the students, therefore, the perceived language obstacle hampered his Moodle use. Similarly, Teacher C used the NHK video clips as a language model to correct the students' pronunciation, and Teacher D asked the researcher to help him double-check the revisions of the writing tasks that he gave to the students. Teacher D revealed that *"I don't know how to correct their writing, because I'm not native [speaker of Chinese]."* Although the researcher found that the teachers were quite fluent in Chinese and did not have problems in Chinese writing, the non-native teachers tended to underestimate their Chinese proficiency. In the three non-native teachers' classrooms, the teachers confirmed pronunciation and grammar used with the researcher frequently.

Also, as observed in the classrooms, the three non-native teachers tended to rely on the textbook audios that they used an MP3 player and a CD player to play with in each class. On the other hand, Teacher A, who is a native Chinese speaker, tended to use herself as a language model. She never played audios in the classroom but demonstrated the pronunciation of a word and read the textbooks by herself. These findings imply that the non-native Chinese teachers were more aware of their language knowledge compared with the native teacher. In particular, the non-native teachers tended to use audio resources to assist with their "non-native" pronunciation.

Not only the target language (Chinese) knowledge taught in the classes may influence the teachers' technology choices, but also low English proficiency was found to hinder their adoption. For example, when the researcher was introducing an online animation maker (Vyond) in the training session and demonstrated Kahoot! in the classroom, it was observed that Teacher C and Teacher D were concerned about the operational interface, which was written in English. Also, when the researcher suggested that Teacher D could attend the CALL related international conferences, he hesitated, saying *"But they are all in English, aren't they?"* These results show that the teachers who perceived themselves with a lack of English proficiency may cause the barriers to access CALL resources which only support English.

5.2.1.2 Value

According to EVT (Eccles et al., 1983; Wigfield & Eccles, 2000), *value* is regarded as the motivation that an individual has when deciding to do something. The values of using educational technology for teaching purposes that the teachers perceived can be broken down into four categories, which are *Attainment Value* (work priority,

importance for current teaching), *Intrinsic Value* (interested in teaching cultural contents through technology), *Utility Value* (usefulness of technology), and *Cost* (perceived high effort, negative emotions: anxiety and stress).

(3) Achievement value

f. Work priority

For full-time faculty members in the university, professors' duties include not only teaching and research tasks, but also administration tasks. Due to time constraints, the professors might undertake the tasks they perceive more important and urgent prior than the others. In the research-oriented university, research achievement is a crucial avenue for teaching faculty's promotion. It was found that the teachers in this study tended to use their published textbook for teaching. For example, Teacher B and Teacher C used the textbook they published a few years ago, and the sub-textbook used in the classes of Teacher B, Teacher C, and Teacher D was written by Teacher C. It can be assumed that because online materials cannot be counted as a publication, the teachers were less likely to design online materials in Moodle, though they had found the textbooks were out-of-date and needed to be revised. Regarding how the teachers prioritized their work orders, it was observed that they perceived research activities as important. As had been observed in the classrooms and the emails with the teacher, they announced class cancellation for attending conferences and writing papers occasionally. Also, adopting new technology that the teachers had not used before means that they have to spend time on learning how to use it, and they have to be familiar enough with the usage to apply it to their teaching, and further to teacher their students how to use it.

The relationship between university professors' teaching quality, research, and

administrative activities were investigated in García-Gallegoa et al.'s (2015) study. They found that the professors with more research outputs were evaluated as better teachers compared with the professors with less or no research outputs. However, this study found that the teachers' research interest might be the crucial influence on teaching quality rather than the amount of research achievement. From the teacher profile, it was found that the four teachers were all from Chinese literature background, and their published papers were mostly related to Chinese literature instead of Chinese language teaching. Thus, it seems that their research achievement did not have a direct impact on their teaching quality. Although this study did not investigate the teachers' quantity of administrative work, it can be presumed that Teacher B, Teacher C, and Teacher D might have nearly the same amount of administrative duties since they were in the same department (Teacher A had less administrative work due to contractual conditions). In sum, the teachers' work priority in terms of research might affect their decision in adopting new technology, since developing online materials cannot earn research achievement for them.

g. Importance for current teaching

In terms of the motivation of integrating new technology into teaching, the four teachers were asked to rate the degree of agreement on the survey item (Q.7) "*I am satisfied with my current teaching.*" The results showed that Teacher A and Teacher C were more satisfied with their current teaching statement as they rated four (agree) on the 5-point scale. It seems that the two teachers did not regard changing their teaching statement as important, which can be confirmed with their non-adoption of Moodle and new technology used in their classrooms. Also, as has been discussed previously, the teachers had their own routine of teaching. This means that if they adopt new technology, they might have to change their current teaching procedures, teaching

materials, and to revise the existing syllabus. In other words, if the teachers were satisfied with the current statement, why did they have to take the risk to adopt new methods, which might destroy their established teaching routines? Moreover, the urgency of adopting a certain technology that the teachers perceived is also important. Since the university where the four teachers taught was planning to replace their LMS with Moodle soon at that time. It was predicted that the teachers might have a motivation of trying to use Moodle in this study. However, Teacher B revealed in the interview: *"I will consider using Moodle when the existing LMS doesn't work anymore. So, I am not considering using Moodle at this moment."* These results show that the teachers who were satisfied with their current teaching and the current technology used were less likely to adopt new methods. More importantly, if the teachers perceive it was unnecessary to change their present teaching, they might postpone the adoption.

(4) Intrinsic value

h. Interested in teaching through technology

Intrinsic value refers to the enjoyment that the individuals perceive, which is driven by personal rewards rather than receiving external rewards (e.g., money, avoiding punishment). The concept of intrinsic values is similar to intrinsic motivation (see Ryan & Deci, 2000 for SDT). In the teacher survey, most of the teachers reported that they were interested in using technology for teaching Chinese (Teacher B, Teacher C and Teacher D rated four on the agreement item); while Teacher A gave a neutral response on the survey. The results show that the teachers' interests might not contribute to their actual use in some senses. In other words, though the teachers claimed they were interested in using technology for teaching Chinese, most of them did not actually adopt Moodle nor online materials in their classes. The reasons might be because teachers' interest in teaching Chinese through technology should be broken down into the interest

in the teaching contents, the interest in technology, and the interest in teaching.

In terms of interest in the teaching contents, Teacher A, Teacher B, and Teacher C intended to provide materials related to Chinese culture when being asked what materials they would like to develop in Moodle. The teachers' interest in Chinese culture can be seen not only from their expectations of the online materials but also from the teachers' research achievement. Looking through the articles that the teachers had published, it was found that most of the topics were about Chinese literature rather than CFL teaching and learning. Also, the teachers rated relatively high agreement (M = 3.75) on the survey item (Q12), which asked if they believed that technology could help the students gain more exposure to Chinese culture. Thus, it can be assumed that the four teachers from Chinese literature background were interested in teaching Chinese culture with the use of technology, as Teacher D addressed:

> *If I implement Moodle into my class, I can show [the students] Chinese historic spots and cultural relics, play videos, sing Chinese songs, as I have done in the previous lessons.*

However, their interest in using technology might be another story. As has been mentioned, the four teachers owned different digital devices for their private use. The teachers had less devices and can be seen as less interested in using technology. That is to say, the teachers might be interested in teaching Chinese culture with technology, but they might lack the interest of using technology, which limits their usage.

More importantly, the teachers' intrinsic motivation for teaching might be different, regardless of technology. Stupnisky et al. (2018) found faculty member's motivation for teaching was determined by their intrinsic enjoyment and the identified importance

of teaching. Although this study did not investigate the teachers' motivation of teaching, it is suggested that the teachers' interest in teaching determines if they want to contribute their precious time to adopt a new technology.

(5) Utility value

i. Usefulness of technology

Utility value refers to the individual perceiving the usefulness of doing a certain thing, which is similar to the perceived usefulness in TAM and UTAUT. In this study, it was found that the teachers who had used technology for Chinese teaching perceived the usefulness of technology. The pilot survey investigated the degree to which the teachers regarded using technology to be helpful for their CFL teaching. As mentioned in the result chapter (Chapter 4), the four teachers perceived technology would be useful for teaching (M = 4.00) and would be useful for classroom management (M = 3.5).

However, this utility value did not predict the teachers' intentions to actual use. Teacher C rated five (strongly agree) on the item about usefulness for teaching and four (agree) on the item of usefulness for classroom management; nevertheless, he did not adopt any new technology in his teaching. On the contrary, Teacher D gave neutral answers to the two items mentioned above in the five-point Likert scale, but he adopted more technologies compared to the other teachers.

As observed in Class B2, Teacher B used Google Maps to teach Chinese directional complements. He explained the reasons why he used the method:

> It may be useful to teach this kind of space movement with smartphones, internet, and applications. They (students) are able to listen to the instructions in Chinese

and use it to see their movement, which might be interesting…They can experience

it, just as I did with the use of pictures and Google Maps. I think it is useful if these

kinds of materials can be designed in an interesting way.

In the interview, Teacher D pointed out the activity recording function in Moodle was useful. Although he revealed that he did not check the students' Moodle logs frequently, he addressed:

I found that the recordings of time spent on activities is quite important. I read a

book before, which is talking about how to lose weight. One of the methods of

losing weight is to record what you eat and what time you eat every day. By doing

so, what you actually eat can be visualized, can't it? What you eat is clear from

the recordings. If we utilize the recording function for learning processes, we can

know what we have learned so far. Visualizing the learning processes may help

progress and gain motivation.

These qualitative results show that Teacher B considered teaching directional complements through Google Maps as useful to let the students experience the sense of space in the classroom, and Teacher D perceived that Moodle was useful for monitoring the progress of students.

As asserted by Levy (2000, p. 190), "technology always makes a difference; the technology is never transparent or inconsequential." These teachers tended to use technology for the purpose that cannot be replaced by traditional tools like "pen and paper." According to Levy's (1997) tutor/tool framework, the role of technologies in CALL are generally categorized as tutor and tool. A tutor instructs and provides

feedback on learners' output usually with drill-and-practice activities; while a tool does not provide feedback and is not designed for language learning initially but serves to access visual, audial, textual materials for instructional purposes. As had been observed, the teachers used MP3 players to play audios, present texts through PowerPoint, used Google Maps to help the students experience the virtual world and tracked students' learning progress through Moodle. These teachers tended to use the certain technology they perceived useful as a tool to support their existing teaching.

(6) Cost

Cost refers to an individual's perceptions of the loss of time and alternative opportunities, required effort and negative psychological experiences (Eccles & Wigfield, 2000). The findings indicated that the teachers in this study perceived the cost of adopting new technology into their existing teaching may affect their avoidance-oriented behavior, that is, the resistance of technology. The following two subcategories were found across the data: perceived high effort and negative emotions.

j. Perceived high effort: Time, financial constraints and large class size

In the pilot survey, the teachers' responses to the cost of integrating technology into Chinese teaching were generally neutral. The teachers' perception on "using ICT for pedagogical purpose will gain more effort (e.g., time consuming, heavier workload)" (item 6) ranged from three to five (M = 3.25; SD = 0.50) on the 5-point Likert scale, and their perception of a lack of financial or technical support for integrating technology into teaching (item 8) ranged from two to four (M = 3.00; SD = 0.82). As observed in the classrooms and the teaching environments, the classrooms were equipped with basic ICT machines and the teachers had at least a PC in their office. Also, the university provided the teachers with research funding that could be used to purchase a computer

and had a technical support team that helped teachers to solve technical problems in the workplace. However, the teachers perceived the conditions differently, which might because they had personal expectations and concerns about how and what technology should be used in the classrooms. For example, since Teacher B used Google Maps to teach directional complements, the researcher suggested trying VR glasses. However, Teacher B noted that *"Isn't it expensive?."* On the other hand, Teacher D showed his interest in using Quizlet for teaching, but he found the pop-up advertisements annoying. Thus, Teacher D said he did not mind pay extra money to block the advertisements.

In line with Ertmer et al.'s study (2012), time constraints were found to be a barrier to integrating new classroom technologies. For example, when the researcher asked the teachers why they had not log in to Moodle after the training session, Teacher A and Teacher B claimed that they were "too busy." As teachers' time is extremely valuable, in particular for the professors have to do not only teaching but also research and administrative works, the teachers perceived high cost of time and effort to adopt a new technology having not used previously. The teachers had to learn how to use Moodle and be familiar enough with the usage to utilize it in the classroom settings before implementation. Thus, it comes with no surprise that Teacher B argued that "*Teachers have to spend too much time doing it.*" Also, as Teacher B declared that "*it might take time to design [the activities],*" the perceived cost of designing materials through Moodle can explain why the teachers preferred using the existing online resources as supplementary materials and "digitized textbooks" rather than developing online materials. Similarly, although Teacher D designed writing tasks through Moodle, he revealed that it costed a huge amount of time to provide feedbacks to the students.

In addition to time and money, large class size was considered as a barrier to

implementing learning tasks with the use of technology as well. Due to the increasing number of Chinese language learners in Japan, it is common that there are above 30 students in a university's Chinese classroom. Teacher C addressed in the interview that: *"In the teaching environment, it is better to decrease the number of students to below 20 in a classroom, which may be easier to teach."* Teacher B also revealed that it was difficult to manage the students' learning processes and outcomes. As mentioned previously, Teacher B had assigned a task asking the students to use a smartphone to take a video to introduce the campus a few years ago. The researcher asked Teacher B why he did not provide the task these years. According to Teacher B, he pointed out that *"It is difficult for thirty students [to do such a task]. It was interesting to divide about ten students into groups. For example, four students in one group: two students introduce and the other two take the video."* Thus, the results indicated that the large size of the Chinese classrooms were perceived as the gaining effort for the teachers to adopt educational technology.

k. Negative emotions: anxiety and stress

Human's emotion can be seen as a dynamic system that is associated with cognition, social behavior, and other human characteristics (Cuéllar & Oxford, 2018). As Williams, Mercer, & Ryan (2016) note, "In reality, it is impossible to truly separate the affective elements of our psychology from other facets of our minds and from interactions with contexts and other people." Thus, the subcategory: *negative emotions* focuses on the teachers' personal emotional cost that related to their anticipated negative affect influenced by technology use; the other emotions that are affected by interpersonal factors are discussed in the next section (see **5.2.2 other factors**). The following two emotions were found in the study: anxiety and stress.

First, the non-native teachers' anxiety of providing inputs plays a crucial role in technology adoption and usage. As mentioned previously, due to the lack of self-efficacy in terms of Chinese proficiency (i.e., speaking and writing), the non-native teachers tended to use audios as the language model and asked a native Chinese speaker to double check the feedback provided to writing tasks. Also, previous studies have found that teacher's anxiety toward technology negatively predicts their intention to adopt technology for teaching (e.g., Bai, Wang, & Chai, 2019; Chen & Tseng, 2012). The current study also showed that the lack of confidence in computer skills hampered the teachers adopting the technology they were not familiar with. For instance, Teacher D asked the researcher to upload the learning tasks to Moodle for him for fear that he might destroy the system.

Secondly, stress, in particular, the teachers' personal-oriented stress and technology-oriented stress were found over the time. The four professors were responsible for teaching, research and administrative duties in the workplace. It was found that the teachers' burnout had negative effects on teaching with new methods. In the interview, Teacher B revealed that

> *"I have heard about interactive learning and active learning, and I wanted to try teaching in Chinese in the whole class, but I have to write research articles. It takes time to learn a new method."*

Also, during the classroom observations, it was found that the teachers canceled classes to attend conferences or to write articles before the deadline of submission. The workload stress was mentioned by Teacher A as well, as she revealed that *"To be honest, I don't have time to do any extra work."* The teachers' burnout can explain why they

were not satisfied with their current teaching but did not take action to change. Moreover, the teachers' interest in trying educational technology but without adoption, and their unwillingness to develop online learning materials can be explained by the workload stress.

Regarding technology-oriented stress, in line with Lam and Lawrence's study (2002), the fear of teacher roles being taken away by technology was found in the current study. The teachers who use CALL technology as a tutor (i.e., the X System) previously concerned that their control over the students were reduced, since "*teachers become simply a manager*" who monitor students engaging in the drills with computers. These prior negative emotions the teachers experienced might cause the intentions of technology use for teaching in the future.

5.2.2 Other factors

The below results integrated from the analysis methods present the societal factors associated with socio-cultural and interpersonal factors that affected the teachers' adoption of educational technology use for CFL teaching. The factors are interrelated but were mainly divided into three categories: sociocultural milieu and teacher ecology, institutional milieu, perceived students' attitudes, following with eight subcategories.

Table 88 *Societal factors affecting teachers' educational technology adoption*

(3) Societal	Sociocultural milieu	l. Hierarchy
		m. Group-oriented culture
		n. Perceived the other teachers' motivation

Institutional milieu	o. External stimulus
	p. Support
Perceived students' motivation	q. Perceived students' motivation of CFL learning
	r. Perceived the role of teachers and students

5.2.2.1 Sociocultural milieu

l. Hierarchy

In the hierarchical society, where personal decisions are taken by the superiors, it was found that the decision-making process of technology adoption was top-down in the university. That is to say, the policies regarding technology use were promoted by the institution (i.e., the university) or the department, and the teachers followed the curriculum. Constrained in the policies and curriculum, the teachers had the authority to decide teaching methods and materials used in the classrooms. As mentioned in the result chapter (Chapter 4), Teacher A and Teacher B were asked to use the X System by the previous department they worked for, even though they were not satisfied with it. Not only the obedience to authority, the *senpai-kohai* (senior-junior) hierarchical interpersonal relationship was observed within the teachers as well. In the group meeting for receiving the teachers' permission to conduct this research, and in the workshop for introducing Moodle, it was observed that Teacher B was the talkative one compared with the other teachers, who showed agreement with him. However, in the individual meeting, Teacher A revealed that *"Teacher B is our junior. So, according to the hierarchical relationships in Japanese society, we cannot say no to him, even if we don't agree with his thoughts."* Thus, the junior teachers seemed not to be encouraged to speak out in front of their seniors in the teaching context.

The hierarchical relationships between teachers and students were also found in the study. Since teacher authority is reinforced in this culture, the teacher-centered teaching style was considered "normal" in the four teachers' classrooms. Following the institutional policies, the teachers were empowered to decide what teaching methods and materials to use under the common curriculum. In other words, the teachers made the main decisions on what and how technology should be used in the CFL classes. Rooted in the traditional Asian culture's social hierarchy, it is not surprising that the teachers used educational technology in a teacher-centered way with a lack of producing students' creativities. In the postfigurative society where teachers are expected to be "wise elders" (Cook, 2008) in the classroom, the cultural milieu itself might be a barrier to promoting CALL. Since the culture sees teachers as the authority of knowledge, it might be difficult to move from structural CALL to integrative CALL (Warschauer, 1996). When the teachers had to shift their expected role from the authority of knowledge to "learners of technology," the fear of losing face in front of their students might affect their use of technology in the classroom (see also Bartlett, 2020; Tao, 2014). Teachers' fear of showing their weakness and then being judged in the teaching context can be seen as a barrier to trying new methods regarding innovative technology use. Conservative teaching methods or teaching approaches may be a relatively safe way in this cultural milieu. Thus, even though the teachers adopted technology, they tended to use technology as a tool to assist language "teaching" rather than "learning."

m. Group-oriented culture

As mentioned in the literature, Japan is a group-oriented culture where people respect social harmony in the group (see Benedict, 1946 for "collectivism"). In this study, it was found that the group-oriented teaching environment rooted in the culture might

constrain teacher agency to adopt innovative technology for teaching. Many researchers have suggested that the teaching community provides teachers with the opportunities to practice technology use for teaching (Ottenbreit-Leftwich et al., 2018; Ertmer & Ottenbreit-Leftwich, 2010; Son, 2018). The four teachers in this study were colleagues who were expected to build a teaching community to share and exchange teaching methods. However, the lack of ICT-related sharing, discussion, and support among the CFL teachers at the university was found not only in the data collected in the teacher's survey (questionnaire item 9), but also in the short talks and interviews with the teachers. The teachers tended to express their respect for others in order to maintain harmony in the workplace. As Teacher A revealed that "*We are colleagues, so we don't propose working methods. Should we say anything? No, we don't. We can't…At least these teachers don't communicate about teaching methods.*" Although the teachers found the sub-textbook they used was out of date, as the teachers pointed out *"It was published more than ten years ago, so some of the words were old." "The example sentences are not useful.,"* they tended not to voice their opinions in front of the colleague. This lack of discussion about teaching might have a negative impact on teacher agency.

As has been observed, the teachers were in the context where they were not necessary to receive training in language teaching and learning, nor in computer skills, but the teaching community was not supportive as they tended to work separately from each other. When asked what the teachers would do when they encounter teaching problems, according to the teachers' responses in the individual interviews, they revealed that they preferred solving by themselves rather than asking for help from the other teachers. Instead of discussing teaching methods within the teaching community, it was observed that the teachers tended to reveal their thoughts with the researcher. It was interesting that the four teachers asked the researcher what the other teachers were doing in their

classrooms. Teacher A told the researcher that *"I am jealous of you, because you can see how the teachers are teaching."* The four teachers often showed their curiosity about the other teachers' teaching. It can be assumed that the group-oriented workplace culture discourages the teachers from standing out from the group. The concern about course articulation was mentioned by Teacher A, who taught advanced learners. She argued that though the teachers were free to teach in various ways, she preferred the teachers in the department teaching with similar methods. As she pointed out, when the first-year students took advanced Chinese courses in her class, the students might have difficulties transferring between different teachers' teaching styles and learning contents. Thus, the teachers might tend to prevent other teachers from "standing out." It can explain why the four teachers taught in a similar way with GTM and teacher-centered styles without using technology in the classrooms.

n. Perceived the other teachers' motivation

This study found that the teachers were aware of the other teachers' thoughts and behaviors, though there was a lack of communication within the teaching community. As mentioned previously, the teachers seemed to be unlikely to discuss their teaching with each other but would rather ask the researcher what the other teachers were doing in the classrooms. In addition to their curiosity about the others' teaching methods, the teachers also showed their concern for the Moodle logs. The teachers were not told that their activity logs in Moodle were tracked by the researcher and the other teachers, but it was interesting that two of the teachers noticed the tracking function and were concerned about it, as Teacher A asked the researcher: *"Can I see what the other teachers are doing on Moodle?"* and Teacher D asked the researcher: *"Am I being tracked by you?"* It seems that the teacher was worried about being tracked through

Moodle; however, at the same time, they would like to know what the others were engaging in. The perceived social perceptions affected the teachers' decision-making process. In other words, the awareness of being tracked by others might make an impact on the teachers' adoption of the Moodle usage. For instance, Teacher A might avoid using Moodle for fear that her activity logs were observed by the other teachers; while Teacher D might engage in Moodle actively to show his progress on technology use to the other teachers or to the researcher, who he regarded as a "professional CALL teacher."

In the individual interviews for the teachers, when asked about the teachers' attitude towards integrating technology into their teaching, it is interesting that they tended to perceive what the other teachers' attitudes were. For example, when the researcher asked Teacher A the reasons why she hesitated to use technology and Moodle for teaching, she responded that *"Some teachers are not familiar with technology."* Similarly, Teacher B noted that *"I think the only teacher who use computer for teaching is Teacher E (another teacher in the department)."* As can be seen from the responses, the teachers perceived not only the other Chinese teachers' skills and motivation of educational technology, but also inferred another teacher's CALL usage. It was found that the teachers regarded Teacher E, who is their colleague teaching English in the department with the four teachers, as a professional language teacher excellent in CALL. This can thus make an impact on the teachers' affections in some sense, as Teacher C revealed that *"Teacher E has been using Moodle for many years to manage students' grade, assignment submission, quiz, and various usages. But I am not able to utilize it (as he does)."* For the teachers who did not adopt any technology for teaching, they might give defensive responses to avoid talking about themselves, as Teacher A did not use Moodle but suggested that *"I think it's good for the teachers who teach first year*

students to use Moodle for teaching listening skills." In the teaching environment where there was a lack of teaching support among the teachers, the teachers were curious about the others' teaching and did have some opinions about it, though they did not exchange their thoughts about CFL teaching. The reflections mentioned above indicated how the teachers inferred others' technology usage and attitudes might affect their CALL adoption.

5.2.2.2 Institutional milieu

o. External stimulus

As discussed in the previous section, in the top-down academic institution, the teachers have rights to choose teaching content and methods based on their professional judgment within the institutional constraints (i.e., policies, curriculum). Regarding educational technology use, the institution promoted the LMS but gave rights to the teachers to decide if they would like to teach with or without it. When asked about how the university could encourage the teachers to use Moodle in the future, the teachers' responses indicated that neither "force" nor "reward" could help. The academic freedom for teachers was mentioned by Teacher in the individual interview, as she pointed out:

> *"We are free [to teach in this university] how we like, but the university cannot restrict teachers' teaching methods. Every teacher has unique teaching methods. That's to say, I feel uncomfortable if you force me to use this pen that I don't want to use. Every teacher has their own teaching methods and habits. You think this pen is useful, but for me, I am used to using my own pen."*

The pressure to use instructional technology from the institution has been criticized in

literature. Indeed, academic freedom should be respected to empower teacher agency without external interference. It might be dangerous for the institution to force teachers to use technology for teaching that conflict with the teachers' beliefs and teaching styles, as it might cause affectively negative results (see the *emotion* section). As Benson (2008) points out, how to balance teacher training and situational freedom might be challenging for institutions.

Nevertheless, external motivation seemed not to encourage the teachers to use the existing LMS. According to Teacher B, the university gave awards to the teachers who used the LMS effectively. The teaching results were then presented to the public in a report format, and the university told the teachers *"Please imitate it."* As Cook points out that "language teaching classrooms are different from other classrooms because language is not just the medium but also the content" (p. 160), what the CFL teachers could learn from the other teachers' teaching modules designed for different contents might be limited. Moreover, the teachers had not received appropriate technical training nor foreign language teaching training might find it difficult to learn from the content-based class (i.e., non-language teaching classrooms), since the teaching methods and contents were different. Moreover, it is impossible to "imitate" the successful LMS use merely by reading the reports, also, as the teachers argued, it was difficult for them to observe the others in the teaching practices. These results indicate that the role the institution played in promoting the LMS was not effective in some sense, thus, how to promise academic freedom of teaching and make the teaching results openly accessible to the public (or at least within the institution) might be challenging to higher educational institutions.

p. Support

Previous research has found technical support plays a crucial role on teacher's CALL technology usage as it helps teachers develop skills and self-efficacy for technology (Ertmer, 1999; Kessler & Plankans, 2008; Zheng et al., 2018). However, in this study, it was found that the ineffective support provided by the institution might hinder teachers' technology use (see also Asiri et al., 2012). The university provided technical help through phone calls and help desks, which means that when teachers encounter technical problems in the classroom, they have to pause their teaching and wait for the technical staff to come for help. Outside the technical center's office hours, the technical support is normally unavailable if the teachers need to work with technology at home. Thus, the classroom observation confirmed that when the teachers faced technical issues, they preferred to either solve them by themselves or give up using the technology. The difficulties in accessing the technical support team can be seen as a barrier affecting the teachers instructional technology for teaching purposes.

Another negative perception regarding institutional support revealed by the teachers is the insufficient training on technology. According to the teachers, the university usually provided general guidance on new technology (i.e., the existing and the new LMS) in a meeting. Generally, the teachers read the manual to learn how to use the functions and asked the technical support team for help if they had technical problems. However, the teachers perceived the institutional support team as "non-professional staff," as Teacher A argued:

"I called them when I had trouble with the PC in my office. When I had to use it urgently, I would rather calling them for help than solving it by myself…But they cannot interfere with my teaching. We don't need them because they don't have professional knowledge. They may be able to do it, but teachers are rejecting them."

The response implied that the teachers considered the technical support team might be useful for solving "only" technical problems, but not for pedagogical support. As mentioned previously, the teachers tended to reveal their thoughts and ask for advice with the researcher who they perceived as "linguistic expert" or "a technology specialist." In such an isolated teaching context with a lack of social support, the teachers were less unlikely to practice technology by themselves. This highlights the urgent need for professional CALL supporters to help with the language teachers in the context, where there was a lack of effective CALL training and social support from the colleagues and administrators.

5.2.2.3 Perceived students' motivation

The relationship between teacher and students is dynamic as teacher's motivation can be affected by the students, and vice versa (Benson, 2008; Dörnyei & Kubanyiova, 2014; Lai, Yeung & Hu, 2016). In this study, it was found that how the four teachers (1) perceived their students' motivation of CFL learning, and (2) perceived the role of teachers and students made an impact on the teachers' decision-making process regarding Chinese teaching and CALL technology integration into the classrooms.

q. Perceived students' motivation of CFL learning

The survey results show that the teachers highly expected (M = 3.75) their students would be interested to learn Chinese through technology. Nevertheless, when asking if the teachers thought their students were actually engaging in Chinese learning through Moodle, the teachers asserted that the students might be interested in using technology but not for learning Chinese. The teachers seemed to understand the weak status of CFL in Japan and the students' lack of learning motivation. As mentioned in the literature

review, Japanese university learners learn Chinese for extrinsic motivation (e.g., getting jobs in the future and regarding Chinese as an easier foreign language to learn compared with other foreign languages) (Koshimizu, 2005; Hu, 2014; Sunaoka, 2017; Wang et al., 2016). In the interviews, the teachers revealed that they knew the majority of students were not keen on learning Chinese and did not have internal motivations, though the population of CFL learners in the department was increasing these years. Most of the students' learning goals were simply for earning credits. Teacher A pointed out the political issues in Japanese higher education: *"The work, or I should say mission for them (the university students) during the four years is to earn credits. It's not about what they learn but earning credits."* For the non-Chinese major students, they had to spend time on earning credits from not only the Chinese courses but also their major subjects. According to the teachers, they knew the students were busy earning enough credits to graduate, and Chinese courses were merely parts of the learning, so the teachers revealed that they did not want to *"increase students' burden."* The teachers regarded that using Moodle would increase study time outside the classroom, which is ideal, but the students *"have more important things to do."* Also, after getting the required credits, if the students wanted to continue their Chinese learning, they could not receive any credits. Thus, Teacher A argued that the policies were not designed well, neither for students with high motivation nor low motivation. *"In order to earn the required credits, the students have to continue to take other courses. For them, it doesn't matter what courses they take, but the credits."* Therefore, the students took Chinese courses because it might be a relatively easy subject compared with the other second languages to get credits.

r. Perceived the role of teachers and students

Since the teachers realized the students' lack of intrinsic motivations to learn Chinese,

they tended to apply a teacher-centered approach through direct instruction. Asserting control over the materials, the teachers decided what the students should learn based on the teachers' interest and teaching beliefs, rather than the students' interests and beliefs. From the classroom observations, formal and informal interviews, the teachers mentioned their relationship with their students, for instance, *"I am like their mother." "They (students) rely on me a lot." "Teachers are always right."* Although the teachers claimed they know their students very well, they seemed to value the traditional role of teacher and students with a dominance by teachers.

The researcher showed the students' surveys responses regarding their Chinese learning goals and interest to the teachers, but the teachers did not adjust their existing teaching methods. Concerning learners' diversity in the large class size seemed to be unrealistic for the teachers to meet every student's needs. Teacher D revealed that he did not know what his students liked because of the age gap, and he pointed out that when he played the video clips in the classrooms the students kept poker-faced expressions. He stated that an expressionless face is part of Japanese culture, with which people do not show what they are really thinking or feeling, but it confused him. According to Teacher D, because he did not know if the students were interested in the contents, he would rather teach what he thought was interesting. Similarly, Teacher B stated that *"too many choices"* of Chinese learning materials on the Internet might confuse the students, and Teacher A would rather prevent the students from learning outside the classroom, or they might learn *"inaccurate"* language knowledge. Instead of teaching the students how to choose appropriate online learning materials and learning strategies, the teachers tended to take control over the students' learning processes. Blocking the students in a bubble seems to be a way to protect the teachers' authority.

Moreover, although Teacher D had asked the researcher to post the YouTube videos related to the textbook on Moodle, he found the students rarely watched them. The students' low engagement might frustrate him to try new methods, as he claimed: *"They did not watch the videos, so maybe it's still better to learn how to read aloud the textbook by rote."* Owing to the students' lack of motivation and autonomy, the teachers' control over learning seemed to be strengthened. The teachers considered students as *"blank paper"* who are naïve learners receiving knowledge and building learning habits by the instruction of teachers. As Teacher C stated that most of the students took the Chinese courses in their first and second year, and they would give up the learning after getting the required credits and stopped at the beginning or intermediate levels. Thus, as Teacher C claimed, his teaching goal was to instruct basic Chinese language knowledge so that the students would be easier to pick up the Chinese language after their graduation. This can explain the emphasis the teachers put on teaching grammatical structures and pronunciation, which were viewed as the fundamental language skills.

From the findings above we can see the learners' lack of CFL learning motivation the teachers perceived as an influential factor hampered teacher professional development. Since the goal of compulsory Chinese courses for the students was to earn credits, the teachers might stay in their comfort zone, being satisfied with the current teaching statement without learning new skills or trying different teaching methods. Adopting new technology for teaching means that the teachers had to learn how to use it and to integrate it into their teaching, as Teacher B revealed that using the LMS would *"gain both teachers' and students' effort."* If the teachers thought the learning outcomes (i.e., results from testing and assessment) were not worth the effort (i.e., learning and applying new educational technology), they might not take the actions of adopting new

technology. Therefore, the social perception can be seen as a vicious cycle or a dilemma of the chicken or the egg, as the teachers neglected the students' interest and learning autonomy, the students will reduce their learning motivation. Then, because of students' lack of learning autonomy, the teachers paved the way for the students as the authority of knowledge and learning processes.

5.3 Student perception and factor of engaging learning with technology

As mentioned in the literature review, in a language classroom, regardless of teacher-centered or student-centered approach, the teacher usually is the one who selects which teaching methods to use. In other words, learners do not make the decision on teaching methods in terms of technology use inside the classroom but accept what their teachers choose for them. Therefore, this study aimed to explore students' perception around educational technology use for Chinese teaching and learning, along with their engagement in the online learning activities assigned by their teacher. Below are the main findings presented as answers to the RQ 3 and the sub-questions below:

RQ 3.   What factors influence the students' engagement in online materials and Moodle?

3.a What are the students' perceptions of technology integration into CFL classrooms through Moodle?

3.b What other factors predict students' engagement with educational technology?

The data collected from student pre-, mid-, and post- attitude survey, classroom observations, group and individual interviews were analyzed separately and thematically coded. The integrated analysis reveals the students affecting students'

engagement in learning activities through Moodle and online materials. In parallel with the factors affecting teachers' adoption and use of technology, students' factors were presented in the following sections, divided into personal perceptions and interpersonal perceptions.

5.3.1 Personal perceptions

Basing on EVT, the students' personal perceptions around using technology for learning CFL were thematically coded as **Table 89** shows below. The categorizes and subcategories were further discussed in the following sections.

Table 89 *Factors affecting students' engagement in learning activities through educational technology*

Theme	Category	Subcategory
Expectancy	(1) Experience	a. Experience of using technology for language learning and device ownership
		b. Learning strategies
	(2) Knowledge	c. Digital literacy
		d. Language proficiency
Value	(3) Attainment value	e. Priority for learning
		f. Satisfaction with current teaching/learning methods
	(4) Intrinsic value	g. Interest in learning CFL through technology
	(5) Utility value	h. Usefulness of technology

(6) Cost	i.	Perceived high effort and time
	j.	Low self-efficacy
Other factors	(7) Sociocultural milieu	
	(8) Perceived teacher's motivation	
	(9) Perceived peers' motivation	

5.3.1.1 Expectancy

(1) Experience

a. Experience of using technology for language learning and device ownership

In the interviews for the students, it was found that most of the students had learned the other subjects through the university's existing LMS. The students taking the content-based courses had assignments that they had to upload their reports to the LMS, and they were required to watch the videos and documents attached to the LMS site. However, according to the students, they rarely had learning activities through the LMS for foreign language courses. Thus, it can be assumed that most of the students had the experience of using the university's existing LMS for content-based academic subjects rather than language learning subjects. Although the students might be familiar with the LMS usage, they might not know how to utilize it for CFL learning without the teacher's instruction. As Cook (2008) states that "language teaching classrooms are different from other classrooms because language is not just the medium but also the content" (p. 90), the lack of language learning experience with the use of LMS and other educational technologies might hamper the students' engagement in the learning activities in Moodle.

Moreover, regarding experience of learning foreign language(s) through technology, the pilot student survey indicated that the majority of the students learn foreign

language(s) through CD (34%), electronic dictionary (26%), and websites (20%). The results show that the students' language learning strategies were significantly influenced by their previous learning strategies and the device(s) they have in hand, with which CDs are attached to the textbooks and electronic dictionary is a common language learning tool in Japan. More specifically, the university students' foreign language learning strategies were rooted from their previous English learning experiences. In Japanese educational system, English is a compulsory school subject in primary school, secondary school, and high school. For most of the Japanese students, the purpose of learning English and the other foreign languages is to pass entrance examinations (Shimizu, 2010), thus, there is a tendency that the students rely on rote memorization to learn a foreign language. These results indicate that the university students lacked experience in using technology for learning foreign languages, with which they tended to follow their previous language learning strategies for passing university entrance examinations. Although the students reported they were interested in using technology for Chinese language learning in the survey, their beliefs about effective learning methods might be rooted in their previous language learning experiences, which are unlikely to be changed in a short period of time.

Regarding using technology for studying purposes, a student in the interview revealed that not until he entered university did he own a PC or a smartphone. For the first-year university students, it is not rare to see that they did not own a personal digital device. The Cabinet Office, government of Japan has been conducting an annual survey on internet use environment targeting on Japanese young people since 2009. The latest statistical report released in 2019 shows the personal devices owned by Japanese high school students were as follows: 92.8% of the students had a smartphone, 22.4% a tablet, 19.7% a laptop, and 9.2% desktop. In the current research, the pilot survey was

conducted to understand the student participants' personal device ownership. The findings seem to confirm the government report. As has been shown in the result section (**4.1.3 Pilot Student Survey** and **4.3.1 Student pre-survey**), still, not every student in the current research had a smartphone or a PC. The lack of accessibility to technology (Ertmer, 1999) remains a critical obstacle to facilitating educational technology for university students in Japan. The high-tech image of Japan seems to be an illusion in some sense, in particular, the lag in educational technology use (see PISA report, 2018). Moreover, although the majority of students own a smartphone (95.6%), they tend to use it as a private tool for playing games and SNS instead of a learning tool (Stockwell, 2008).

In the classroom observations, it was found that a large number of the students used electronic dictionaries in the classrooms. Since the teachers banned using smartphones during the class time, using the electronic dictionary became an alternative device, which was accepted by the teachers and without access to the Internet. Although the functions of an electronic dictionary have been replaced by smartphones, the students preferred using electronic dictionaries and paper-based dictionaries in the classrooms according to the teachers' permissions/recommendations. However, regarding outside of classroom learning, the students revealed that they used their smartphone's browser to look for Chinese words, which is handy and convenient.

b.   *Learning strategies*

As has been mentioned in the previous section, the students' Chinese learning strategies were greatly influenced by their prior English learning experiences, with which they study to pass university entrance examinations. By observing how the students learned in the classrooms, it was found that the students tended to take notes and use electronic

dictionaries or paper-based dictionaries for the classroom learning. It was also found that the students' learning goals met their teacher's requirement. Since the beginner classes had weekly vocabulary quizzes that tested Japanese and Chinese translation and pinyin, the students memorized the word meanings and pinyin with the focus on vocabulary learning. This can explain why the students found Quizlet useful, which meets their learning strategies and learning goals.

In terms of CFL learning strategies, it seems that the students rarely adopt social learning strategies in the classrooms, in which the classroom climate was formulated by the teacher-oriented approach without interactions with peers. To understand how the students learn outside of class, they were asked "*If you have questions about Chinese learning, what will you do?*" in the mid-survey. Still, the lack of interactions with their peers and teachers was identified, with 47% of the students would search the Internet and 10% would solve by themselves, with only 26% would ask their friends. This indicates that the students' learning strategies somehow met their teacher teaching styles.

In the similar vein, the students who used Moodle tended to engage in the learning activities focusing on grammar and vocabulary knowledge, though they claimed they wanted to learn Chinese conversation. According to the Moodle activities logs, the students preferred "reading" the online materials through Moodle rather than contributing "outputs" (e.g., submitting language learning tasks, sending messages to teacher/student, posting comments). The lack of social learning strategies was found not only in the classrooms but also in the online learning environment, which hampered the effectiveness of the LMS implementation. The reasons will be further discussed in the following section (see **5.3.2.3 Perceived peers' motivation**).

(2) Knowledge

c.   Digital literacy

Digital literacy (or ICT literacy) has been viewed as the new focus in the framework of 21st century skills that is defined as "the ability of individuals to use ICT appropriately to access, manage and evaluate information, develop new understandings, and communicate with others in order to participate effectively in society" (Binkley et al., 2012). To understand how the students perceived their digital skills, the 4-point Likert scales were conducted across the research period with four times of the surveys: a pilot survey, a pre-survey, a mid-survey, and a post survey. The results indicate that the students rated low agreements on the following items: "I know how to choose appropriate online learning materials" (pilot: M=2.40, pre-survey: M=2.09, mid-survey: M=2.11, post-survey: M=2.12); "I know how to use online tools for learning" (pilot: M=2.43, pre-survey: M=2.30, mid-survey: M=2.23, post-survey: M=2.43); "I am confidence in my digital skills" (mid-survey: M=2.16, post-survey: M=2.33); and "It is easy for me to use technology for learning" (mid-survey: M=2.37, post-survey: M=2.54). These show that the students were not confident with their digital literacy, particularly, the skills of evaluating the online materials and using the tools for learning.

In terms of technology skills, the students revealed in the interviews that they had basic computer skills and knew how to use their smartphone in general, but they did not have advanced skills (e.g., knowing/using programing languages and building a website). The researcher asked if the students had learned Chinese or English through their smartphone, and the students responded that they merely use it to look up word meanings through the browser. The researcher told the students that they did not need high technical skills to learn foreign languages with a smartphone and showed the

students how to learn foreign languages with their smartphone, for instance, changing the target language on the smartphone, speaking to an intelligent virtual assistant (e.g., Siri), recording and evaluating your voice through the built-in recorder, using the built-in dictionary or dictionary applications. However, the students did not know these functions could be used to learn languages. The students' responses show that though they use smartphones in their everyday life, they did not know how to use it for language learning purposes.

d.   *Language proficiency*

In the interview, the students pointed out that they did not know how to judge if the contents were accurate because of their low language proficiency of Chinese. However, for the intermediate learners, they were not more confident to choose appropriate online learning materials nor to use online learning tools compared with the beginners. Unfortunately, there were no students in the intermediate class who volunteered to take part in the interview, so the reasons why the students rated low confidence with digital literacy could not be confirmed. It can be assumed that the students at advanced Chinese levels might have the ability to evaluate if the contents regarding Chinese language are correct, but "too many choices" can be the factors confusing the students to select the appropriate online learning materials.

Since the students at different levels of Chinese language proficiency had different learning goals, and the language skills they focused varied, they had different concerns about technology use for CFL learning based on the language levels. According to the results gathered from the surveys and classroom observations, the beginners relied more on the audio materials. Also, from the Moodle logs, it was found the students in B2, C2 and D2 Class used Moodle to listen to the textbook audios. Thus, it can be assumed that

because the low-level students were unfamiliar with the Chinese pronunciation system, they tended to use technology mainly for practicing pronunciation. On the other hand, intermediate students who had learned Chinese for above five years tended to focus on the language skills in terms of reading and translation. Thus, the main technology usage in their classrooms was looking for word meanings through electronic dictionaries and online dictionaries.

In summary, the lower Chinese proficiency students were concerned that they were not able to evaluate if the online materials were appropriate for them, especially the accuracy of the contents. Thus, they relied heavily on the textbook audios, which they considered as the authority. On the other hand, the higher-level students were able to judge if the contents were correct, but they did not know how to evaluate which materials or learning tools were useful for their advanced learning.

5.3.1.2 Value

(3) Attainment value

e.   Priority for learning

Considering individual differences in learning goals and motivations to learn Chinese, the students' priority for study varied, and the importance for them determined their adoption of new learning methods. For the four classes of the students, Chinese course was the selective compulsory course but not their major. Therefore, confirming with Teacher A claimed, *"they have other more important things to do."* For the students lacking learning motivation, they were obliged to take the Chinese course. On Student #C3's admission:

I know the importance of learning foreign languages, but my priority is studying

the major subjects and getting licenses. I study foreign languages only before I have tests or when I have free time.

This is quite representative among the students who learned foreign language learning for *"refreshing change of pace."* For the students, Chinese courses and the other language courses were not their priority for schoolwork, neither in their life. Thus, adopting new learning methods means that they had to change their existing learning habits, with which they were familiar with, especially for out-of-class foreign language learning.

Even a few students used Moodle for self-regulated learning, they mainly used Moodle to practice the contents related to the formal classes in order to pass the weekly quiz. Referring to the survey results and interview responses gathered from the students, the purposes of learning Chinese were driven from extrinsic motivations (e. g. for future career, perceived easier to learn than other foreign languages, to earn credits). It seems that they learn the language as a subject, and the ending goals were to get good grades on their academic transcript and to receive credits to graduate. If the students did not see the value of doing the tasks through technology outside of the classroom, they were unlikely to persist in their learning; even worse, they might regard the tasks as "extra work." Although the students claimed they were interested to learn the contents unrelated to the course (e.g., travelling, movies, music) through multimedia, the more important learning goals were to complete the assignment the teacher required, and to pass the examinations and quizzes.

f. *Satisfaction with current teaching/learning methods*

In order to know how the students perceived the importance of integrating technology

into the classrooms, the students were asked to rate their satisfactions with the current Chinese teaching and learning statement in the mid-survey and post-survey after a period of time for their Chinese learning. According to the results, most students were satisfied with the current statement. Specifically, the satisfactions with current teaching were slightly higher than learning. This indicated that the students did not see the importance of changing the existing teaching and learning methods.

Without immediate intrinsic reinforcement and extrinsic rewards, the low motivated students usually followed what their teacher asked them to do. If the teacher asked them to complete assignments through Moodle, they would do it; if not, they were less likely to engage in the activities through Moodle, nor to use any new technology for out-of-class learning. In the interview, the students were asked how they perceived their teacher's teaching styles and if there were needs to change. The students' argued that they thought the teacher was too strict and never complimented them on their achievement. However, it seems the students did not have specific opinions on the teachers' teaching methods. It might because the students did not have specific ideas about how effective teaching could have been. As mentioned previously, most of the students did not have experience of learning foreign languages with technology. Moreover, having been learning foreign languages to pass examinations, the students might not value the changes technology can bring to their learning effectiveness. Being familiar with the existing teaching methods with which the students had been taught, the satisfactions with the current CFL education might hamper their acceptance of new teaching and learning methods with the use of technology, as they did not know how could had been taught/learned better.

In addition, without appropriate training in learning strategies, the students regarded

adopting technology as a new learning strategy, which might be a risk of lower learning outcomes and reduced motivation. Since the students had been using paper-based materials for English learning for many years, adopting technology for learning a new foreign language might be a sudden change of their existing learning methods. In the interview, when the researcher told Student #C3 to reflect how he learned Chinese through the movies, the student revealed that he knew his learning strategies were not effective, but he could hardly change them intermediately. The uncertainty of acquiring word meanings through the contexts was considered as a risk of changing the existing learning strategies, and thus, causing the resistance to adopting new learning strategies through technology. Also, for most of the students, paper-based materials were still their first choice, with which they were familiar. As the students preferred taking notes by handwriting, there seemed to be no urgent needs for using technology-based materials.

(4) Intrinsic value

g.   Interest in learning CFL through technology

The survey results revealed that the students rated a high interest in using technology for Chinese learning, however, their interest did not guarantee their actual engagement. Although The students claimed they were willing to learn Chinese with the use of technology in and outside class, to receive online materials, and to interact with the teachers through SNS or LMS out of class, from the Moodle logs, we can see that only few students had used Moodle to learn outside class, and no students had interacted with the teachers through the built-in massaging function. Consistent with previous studies (e.g., Turner et al., 2010; Wang 2020), the results indicated that although the students hold positive attitudes toward using technology for Chinese learning, the truth is, their interest did not coincide with the engagement.

The reasons why interest did not guarantee engagement are complex, though, here are the potential factors in terms of "interest." First, the students had high expectations for technology. The students seemed to regard educational technology as fantastic, highly advanced technology or devices which they were unfamiliar with. For instance, the students in the interviews revealed that they expected using technology for learning language required advanced computer skills, and the students over idealized educational technology as he thought the Chinese learning processes could be transferred to video game playing. These indicated that the interest the students referred to might be the technology (they expected) itself. As has been pointed out in previous studies, the positive attitudes can be accounted for by "novelty effect" (Clark, 1983; Hew & Cheung, 2013) with which the students perceived technology as a new learning method. However, the interest may diminish as the students become more familiar with, or they find the "technology" was not as they expected.

Secondly, it is similar to the interest in innovation, which is the interest in Chinese language. Since Chinese was a new language to the beginner students, they might find learning a new thing interesting. Going through the honeymoon, the frustration of the learning process might decrease their interest. This can be seen from the comparison between the beginners' (Class B1, B2, C1, C2, D1, D2) and the intermediate learners' (Class A1, A2) self-rated interest survey results, with which the students had learned Chinese for the average of five years rated lower interest across the items related to interest compared with the beginner learners.

Thirdly, it was found that the interest in the contents of the online materials determined the students' Moodle adoption. As mentioned in the result chapter, the students who used Moodle tended to use it to practice vocabulary, grammar, and to listen to audios

as supplementary materials. Even in Class B2 and Class C2 in which the students were not required to use Moodle, the students engaged in the learning materials which they were interested in. For the other aspects related to Chinese language learning, though the students claimed they were interested in Chinese history, Chinese culture and would like to learn contents about travelling to Chinese speaking countries, the Moodle logs showed that the students rarely used the materials that the researcher created based on their interest. Therefore, whether the students were interested in the contents of the online influence their adoption and engagement.

(5) Utility value

h. *Usefulness of technology*

Regarding extrinsic motivation of using educational technologies, the students perceived technology useful for certain conditions which are related to the course contents. Huang et al. (2019) suggest that educational technology should be designed to fulfill the learners' needs, especially for the learners with lower motivation. The quantitative data have shown that the students engaged in the materials through Moodle to support their class learning, for example, practicing vocabulary learning with Quizlet to pass the weekly vocabulary quiz, reviewing the grammar points to clarify what had learned in the classes, and listening to the textbook audios. Though the extrinsic motivation of using the online materials was to support the formal class learning, these self-directed learnings based on the lectures' contents can be seen as the practice of autonomic learning, with which the students tried new learning methods without the teacher's requirement and rewards.

Addition to the value of supporting self-learning, the usefulness of technology can be enhanced by the teacher's promotion. It was found that the students in Class D2, where

Teacher D had implemented Moodle, rated generally higher agreement on the survey items related to usefulness compared with the other classes. As the students mentioned in the interviews, though they were required to do the assignments through Moodle, the processes of submitting the tasks provided them with an opportunity to see the other contents on the Moodle site. Also, as an online platform to communicate with the teacher and review the classroom learning, the students perceived it useful for classroom management. Thus, the more the students engaged with Moodle, the more value of it they could find. In contrast, the students who had not actually used Moodle were unlikely to see the values of it.

Since motivation is dynamic (Dörnyei & Ushioda, 2013), the students engaged in the outside classroom activities through Moodle to pass exams or to get the credits, but during the learning processes, they might also find the new learning methods useful, and then, transferring the extrinsic motivation into the intrinsic one.

(6) Cost

i.   *Perceived high effort and time*

Referring to the previous discussion, the teachers thought assigning out-of-class learning activities would gain the students' effort, since "they have more important things to do." However, the survey results show that the students did not perceive the cost of using Moodle as high as their teachers predicted. For the classes which did not implement Moodle, the students were able to decide if they would like to use the online materials; for Class D2, which integrated Moodle into the formal class, the students were free to arrange their time to engage in the online learning activities. In other words, no matter whether the students were required to use Moodle or not, they were able to take control over their learning outside the classroom. Since the students could arrange

their learning time and how much they would like to make an effort to the informal learning, this can explain why the students' perceived cost was not as high as their teacher expected.

However, it was found that the students in the four classes perceived higher cost over time. Also, the advanced learners in Class A2 rated higher cost compared with the beginner learners. The perceived cost changed over time might be due to the increase of schoolwork. Since the four teachers and the researcher did not force the students to use Moodle, and Teacher D had reduced the online assignment in the second semester, the students' effort on the Moodle activities should have been released. However, from the mid-survey and the post-survey results, it was found that the students' perceived cost regarding workload increased. This implicated that the increasing workload at the university might shrink the students' motivation to complete out-off-class learning through technology, with which they might regard as an extra work for formal learning and were unwilling to put extra effort on the learning activities.

In the study, it was also found that the students needed financial and technical support to utilize technology for CFL learning. The lack of access to online resources remained a critical issue. For example, one of the students did not own a smartphone, and the students reported that they had a Wi-Fi usage limit. Obviously, these physical issues (Stockwell, 2020) seem to be the primary obstacles to the engagement. Moreover, the technical issues the student had reported were mainly about the login problem, as the student in the interview revealed, the process of login to Moodle was redundant that reduced their motivation to open the Moodle page. Since the students were low motivated to learn the language, the usability of the system might determine their willingness to use the technology for learning Chinese.

j.   Low self-efficacy

Previous studies have suggested that the students' perceived ease of use of a particular educational technology makes an impact on their acceptance (Hamidi & Chavoshi, 2018; Moreno,2017; Park, 2009; Wu, & Chen, 2017). However, this study found that the ease of use could not only refer to the technology itself, but also the perceived ease of the tasks, which might determine the students' intention of engagement. For instance, it was found that if the students thought the tasks were too difficult to accomplish, they might decide not to complete. From the Moodle activities logs and the classroom observations, it was observed that Teacher D had assigned a listening task through Moodle, but none of the students finished it. As claimed by the students in the classrooms, the task was above their Chinese level. This shows that the tasks should be designed to meet the learners' level/ability. If the students believed they were not able to achieve the goal, they were unlikely to persist. Moreover, Huang et al. (2019) suggest that educational technology designers should be aware of the difference between users and learners, because learners generally have lower motivation to engage in the task. Thus, when learners encounter technical problems or learning difficulties, they are more likely to shrink their intention to use or give up their usage.

This study also found that the students' perceived cost and self-efficacy are correlated, as the students estimated how much effort they should make to make the desired outcomes. With the lack of confidence in digital skills and language proficiency, the students might avoid engaging in the online learning activities that they believe little difference would make.

5.3.2 Other factors

5.3.2.1 Sociocultural milieu

Social factors were found to affect the students' adoption and the engagement of the Moodle use in this study. Three major findings were identified: (1) the *face* culture, (2) the *shame* culture in the Japanese context, and (3) the *uncertainty avoidance*. Firstly, the Self Determination Theory (SDT) suggests that people driven from extrinsic motivation tend to do the certain task to avoid feeling guilt or punishment, or to receive rewards. However, this study found that the social factors were not affiliated to the dimensions of the extrinsic motivations. It was found that face culture played a role in the students' adoption to educational technology. In the individual interview, Student #C3 revealed that he perceived Moodle were less relevant to his interest and learning styles, as he preferred face-to-face teaching/learning. However, he acknowledged that he had used Moodle sometimes because the researcher made it for the students. This intention driven from the extrinsic motivation to save the researcher's face can be seen as a significant finding, which is rarely mentioned in the previous studies. It is interesting to find that without intrinsic motivations, the student was still willing to engage in the learning activities simply because of the interpersonal factors. This highlights the need for motivation theory applied to certain social-cultural contexts, since none of the dimensions of the motivation in SDT can explain this student's case.

Secondly, this study found the *shame* culture might cause the students' resistance to technology and hamper their persistence of engagement. The data gathered across multiple methods had indicated that the students' intentions and behaviors were not always consistent. When Teacher B and Teacher C asked if anyone had used the Moodle materials at home and asked the one who had used Moodle so far to raise their hands,

but no students raised their hands. However, according to the Moodle activities logs, one student in Class B2 and another student in Class C2 had used Moodle before the teacher inquired. The shame of "showing off" or "receiving compliments" might cause the students to be aware of how others look at them, and thus, they might change their behaviors or avoid doing something. In this case, the students did not acknowledge their Moodle use in front of the class, but in the interview, they revealed that they found Moodle was quite useful for their Chinese language learning. Unlike Class D2, where every student was required to use Moodle, the students in Class B2 and Class C2 were self-regulating to do the out-of-class learning. Thus, their intention might be changed by the classroom atmosphere. As mentioned in the *collectivism* section, the fear of being "unique" among the students in the classroom seemed to be a drag on the educational technology used for autonomous learning.

Finally, the *uncertainty avoidance*, which was defined as a society's tolerance to situations that are "novel, unknown, surprising, and different from usual" (Hofstede 2011). This study confirmed with the previous studies looking at Japanese learners in the CALL settings (Jung, Kudo, & Choi, 2012; Thomas, 2017). Adopting innovative technology for language learning seems unlikely to change in the context. It was found that the students tended to value accuracy when learning a foreign language. This means that if the students found the online materials with a mistake, they were unlikely to trust the materials, also, they were reluctant to make mistakes as well. The intolerance for ambiguity was also shown to have bearing upon the students' attitudes towards CALL materials, which were regarded as new learning methods for them. In addition, having been learning in a teacher-centered learning context for many years, the students generally hold the belief that "teachers are supposed to have all the answers" (Hofstede 2011). This strong uncertainty avoidance might strengthen their reliance on teachers,

and thus, being reluctant to take the role as autonomous learners, who are able to pave their way of learning foreign languages with technology.

5.3.2.2 Perceived teacher's motivation

The study found that the students' engagement in the online materials were affected significantly by their teacher's motivation, also, the students' attitudes toward educational technology were influenced by their teacher as well. In the classrooms, the researcher observed that the teachers rarely used technology, so the researcher asked the students if they thought more technology should have been adopted to facilitate Chinese teaching and learning. However, the students in Class C2 stated that he thought the teacher did not like technology, so there was no need to use technology in the class. Moreover, the students in Class D2 revealed that they were not surprised that Teacher D did not have a smartphone, because they found Teacher D seemed to be unfamiliar with technology when he was using a computer in the classroom. These results indicated that the students did notice if their teacher use technology and how to use it in the classrooms.

Similar to the teachers' concerns about the tracking functions on Moodle, the students also revealed their thoughts about the activity logs. In the interview by the end of the final semester, when the researcher informed the students that their teachers were able to view their time spent on Moodle, some students stated that they had already known it, while some students had not noticed it. However, unlike the teachers who were worried about being tracked by the other teachers, the students perceived the recording functions positively, which could show their task engagement to the teachers. According to the students' responses in the interviews, they pointed out that by showing their time spent on Moodle, they might be able to make a "good impression" on their

teacher. Motivated by extrinsic motivation of expecting to receive "extra grades," Student #D19 argued that completing assignments and using the materials unrelated to the course contents through Moodle might become "a sense of obligation" because *"being seen by the teacher makes me study harder."*

Although the majority of students believed the Chinese teachers were not interested in educational technology and were not skillful at using it, the survey results showed that the students still need learning support from the teachers, especially, to choose appropriate online materials for them and to help them manage their learning. It seems students were obedient to teachers in the cultural context where people regard teachers as authority figures. In the interview, the student expected that "t*eachers should know everything*" and hoped the teachers could provide technical support and suggestions for studying. The unrealistic expectation that teachers should know everything might gain the teacher's pressure to integrate technology into classrooms in some sense. This interrelation among the students, their teacher, and the technology showed that the students' intentions to engage learning through technology were strongly affected by their perceived teacher's motivation, and thus, the students' perceptions might make influences on teacher's adoption. Therefore, these powerful social influences in the educational settings in the study can be seen as a significant finding.

5.3.2.3 Perceived peers' motivation

Another social influence affecting the students' intention to engage in online materials through Moodle has been found in the study is the students' perceived peers' motivation. That is to say, how students view the other students' attitudes toward technology might make an impact on their usage in some senses. Hampel and Pleines (2013) suggest that Moodle can be used to facilitate students to interact with peers. However, this study

found that the students did not value collaborative learning, no matter if technology is used or not. The possible reasons are the lack of experience of learning foreign languages with peers through technology, so the students were not able to imagine how technology can be used to learn with peers. As has been observed in the Chinese language classrooms, none of the teachers' assigned tasks for collaborative learning. Thus, when asked if the students would like to participate in learning activities with their classmates, the students revealed that they were unwilling to do so. According to the students' responses in the interviews, they perceived their peers were at the same Chinese level with them, thus, they did not want to acquire "*wrong language*" and "*wrong Chinese pronunciation*" from their peers. This shows that the students did not know how language learning tasks could have been designed effectively for collaborative learning, as their language teachers merely asked them to read textbooks with peers in the classrooms.

With the belief that learning foreign languages with native speakers was more valuable compared with learning with peers, in the interviews, the students stated that they prefer to interact with Chinese native speakers face-to-face. However, Student #B4 revealed that he had an experience of language exchange, but it was not very effective. This implied that though the students were willing to take part in informal learning activities outside of classrooms, without pedagogical strategies, they were unlikely to achieve their learning goals. Regarding their intentions to learn Chinese with peers, the survey results showed that the students strongly agreed that there was a lack of sharing and discussing educational technology among students (Q31). Thus, the researcher asked the students if they wanted to exchange their Chinese learning methods with their peers, they claimed that it was not necessary to do so, because they thought discussing learning methods intentionally was "*awkward*." Similar to the teachers in this study, the students

were less willing to learn with their peers who had the same position and the same Chinese proficiency within the group, as they tended to learn by themselves or ask for other people's help outside the classroom. Results retrieved from the mid-survey for students showed that when the students encountered difficulties learning Chinese, the majority of them tended to solve by themselves (10%) or search the internet (47%). Although 26% of the students reported they would ask their peers in the class, the students in the interviews revealed that they mainly asked their classmates about examination schedule or test scope, rather Chinese learning methods.

In the interviews, the students disclosed that most of the students in the Chinese language classes "*always study for studying*" and use Moodle for the preparation for formal learning to pass examinations. With the lack of intrinsic motivation of learning Chinese language and culture, the students perceive their peers were less motivated, as Student #B4 claimed:

> *The materials on Moodle are good for me…But for the students who are not using it, I think the fundamental problem is whether they have the motivation to learn Chinese.*
> *The concerns about peers' motivation might affect how students perceive collaborative learning through technology, for fear that the low-motivated students would hold high-motivated students' learning back.*

Regarding the other students as less-proficient Chinese learners and less-motivated learners, the students seemed not to value the opportunities for learning Chinese with their peers through technology. The reluctance to play an asymmetric role in working in groups, nor to share learning experiences with the peers might obstruct the

integration of educational technology into language classrooms, specifically, the technology designed for supporting collaborative learning (i.e., Moodle).

Chapter 6.   Conclusion

This study explored the factors affecting CFL teachers' and students' perceptions around educational technology. The main findings of this study are summarized in the final chapter, in which insights into researching, pedagogy, and CALL system and material design will be discussed. These implications for educational technology integration into CFL classrooms will not only be limited to the Japanese university contexts, but also reverent to other contexts with similar social-cultural background. Finally, the limitations of this study are pointed out, and the chapter is closed by the suggestions for future research and policies.

6.1 Overview of Main Findings

This study used mixed methods to explore teachers' and students' perceptions of technology use for CFL education, furthermore, to understand the reasons behind their technology adoption. The findings indicate that the teachers' and students' perceptions were influenced by personal factors, interpersonal factors, and contextual factors. The interrelationship between teacher, students, and technology in the CALL (or non-CALL) context is illustrated in the following figure.

The figure below illustrates that teachers' and students' perceptions are not only influenced by personal factors, but also how they affect each other within the certain context. In other words, nested in the top-down social-cultural context, it is difficult to determine which factor is stronger than the others, because as has been found in the

study, the factors are all interrelated. The relationship between each of the three main elements, teachers, students, and technology are bidirectional, and the factors that determine how one impacts upon the other are typically a combination that force the impact in one direction or the other. At the core of these factors lies the interpersonal factors, that is, the relationship between the participants and the other elements, including the classroom, the teacher community, the institution, or the social culture. The outer ring affects those elements inside it, and this pattern continues all the way down to the core interpersonal factors. Thus, each of the elements are inseparable from one another as well as the overall context—both immediate and larger—of the educational setting.

Figure 24 *The CALL context influences teachers' and students' perceptions*
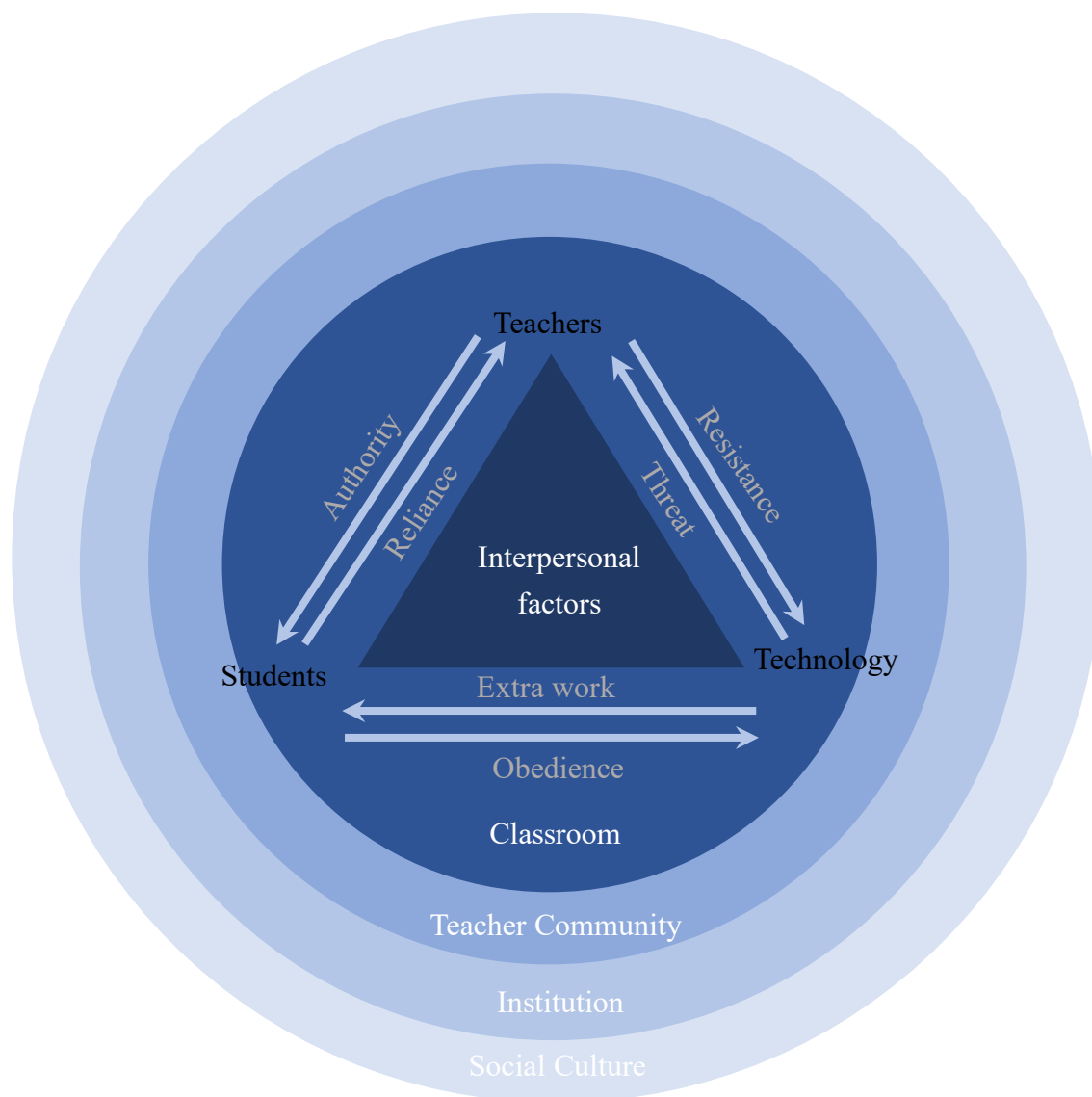
Guided by the historical and current social culture and constrained by the institutional policies, the four teachers participating in the current study were authorized to decide what and how to teach CFL in their classrooms. However, as has been found in the study that the teachers were aware of if the other teachers were using technology for teaching in the CFL classrooms, with a lack of sharing and discussion on teaching methods. The teachers were also found that they tended to ask for teaching advice outside the existing teacher community, though the four teachers were in the same department. This outlines the challenge for institutions to facilitate teachers learning

communities, where the teachers may exchange ideas about integrating technology into their teaching practices. The teacher ecology affected by the social-cultural backgrounds seems to be unlikely to promote innovative teaching methods with the use of technology, since the teachers were aware of the others with the concerns about standing out from their *senpai* (juniors), also, being different from the others seems not to be encouraged in the context.

Despite the fact that the institution provided the teachers with sufficient access to educational technology (e.g., facilities and technical support), the teachers rarely used it. It seems that the first-order barriers (Ertmer, 1999) could have been removed, but the second-order barriers (Ertmer, 1999) in terms of the teachers' personal factors around instructional technology could not easily be changed. The following figure outlines the factors affecting the teachers' perceptions on their beliefs about technology integration into CFL classrooms.

Figure 25 *Teachers' personal factors affecting perception around CALL*

Experience

Experience of using technology for
teaching/learning

CFL learning
experience

Teacher training

CALL skills

Language
knowledge

Expectancy

Knowledge

Attainment
value

Utility value

Work priority

Usefulness of technology

Importance for current
teaching

Intrinsic
value

Interested in teaching
through technology

Perceived high effort

Cost

Negative emotions

Value
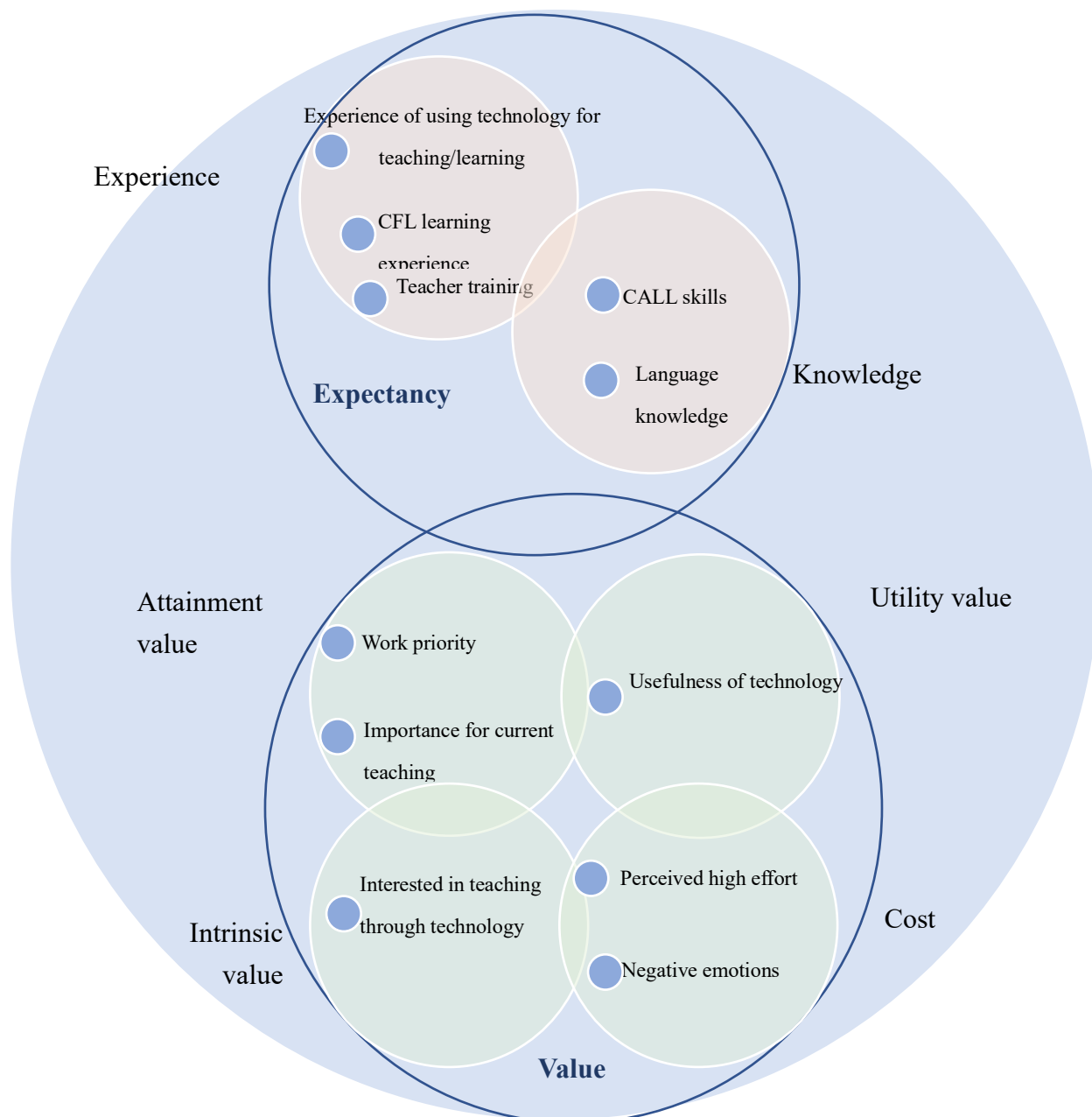
Having not been trained as a CFL teacher before, it was found that the teachers in this study found that they tended to teach in the ways that they had been taught previously. Thus, the teachers generally believed that adopting new technology might be reductant, as they believed that even they had not learned with it but still acquired Chinese successfully. Also, adopting new technology seemed to be a burden for the teachers, due to not only the lack of teaching and learning experience with CALL technology, but also the limited professional skills in terms of digital skills, SLA knowledge, and

language skills. This means that if the teachers intended to integrate technology into their classrooms, they had to learn the new skills as a learner. However, workloads for the university teachers seem to be heavy enough. Since the teachers had their priority for work, adopting new technology and new teaching methods seemed not to be urgent for the current teaching statement. Although the teachers claimed they were interested to try new technology for teaching Chinese, they were not well prepared to accept it. The teachers who had negative experiences with the CALL system used in the previous workplace seemed to be reluctant to adopt Moodle, though the functions and designs were totally different. It shows that negative emotions play an important role in experience, with which the teachers concerned their role would be taken from the CALL system.

In the teacher-centered teaching/learning context, the teachers seemed not to value the collaborative learning methods through Moodle. As mentioned previously, the teachers preferred teaching face-to-face in a one-way interaction (e.g., teacher to students) with a belief that students rely on teachers. In this way, the teachers hardly gave control over learning to the students. The teachers even did not encourage the students to learn Chinese outside of the classrooms, for fear that they would learn "wrong language." With a belief that students should learn "standard language" in the classroom settings, the teachers were unlikely to use authentic materials which can be easily found through the internet. For the teachers, technology seemed to simply become digitized tools for their existing teaching, for instance, they expected to upload the textbooks' texts and audios on Moodle. The potentials of Moodle as a social learning system were underestimated in this sense, in other words, the traditional classroom formats seem unlikely to be changed even with the use of technology.

Regarding students' personal perceptions around using technology for learning Chinese language, the significant factors were summarized in the following figure (see **Figure 26**). As discussed in the previous chapter, the students in the teacher-centered context acted passively regarding. Since the teachers made decisions on the teaching methods, the students received knowledge from the teachers with the focus on grading. That is to say, the students generally did not have specific thoughts about how CFL teaching and learning should be, but simply followed what the teachers required them to do. Despite the fact that the students were good at taking examinations, their foreign language learning styles were somehow fixed, as they have been "studying for studying." Although they were more confident with technology skills compared with their teachers, the majority of the students did not know how to use the technology in hand (e.g., PC, smartphone) to learn Chinese. Most of the students had not used technology for learning foreign language and had limited knowledge about digital literacy and Chinese language proficiency, thus, they tended to rely on the teachers to choose CALL materials and tools for them.

However, the students perceived engaging online learning tasks as an "extra work" for them due to their priority for learning. Because Chinese language courses were not their major, and they had "more important things to do" during their school life, learning Chinese outside of the classrooms through technology seemed to be less urgent work for them. Also, without strong motivations to learn Chinese, the students seemed to be satisfied with the current teaching and learning methods, thus, integrating new technology into the existing classrooms seemed less of a necessity for the students. Despite the fact that the students acknowledge technology could be useful, with which they could take the advantage of audio and video materials, they perceived high cost (e.g., time spent and high effort) but low efficacy that CALL materials could bring. But

the truth is, again, the students did not know how to use the materials in effective ways and their foreign language learning styles were fixed in some sense.

Figure 26 *Students' personal factors affecting perception around CALL*
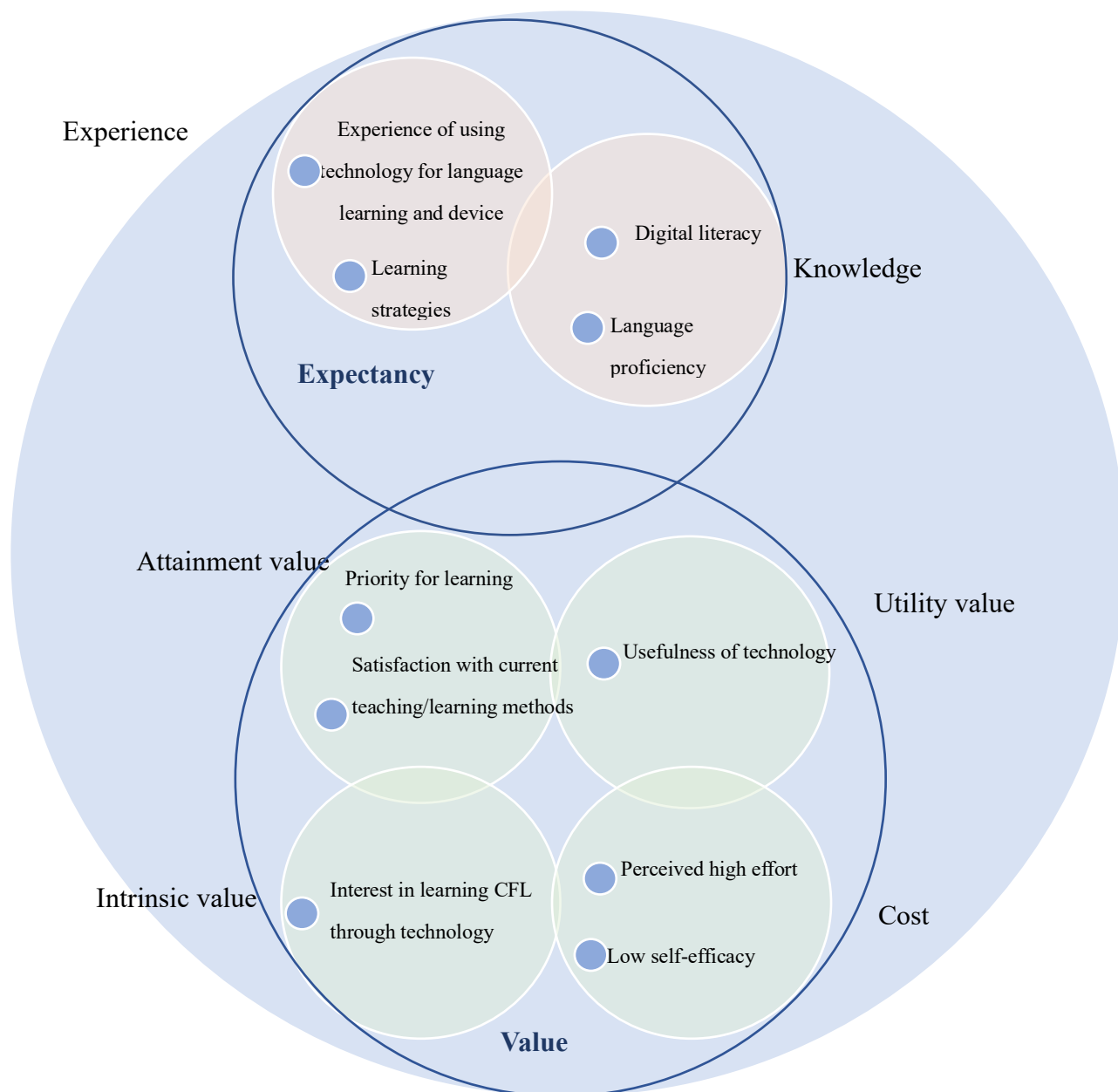
These personal factors in terms of students' perceptions around technology integration into CFL learning might hamper their acceptance and engagement in online materials through Moodle. Worth to mention here, the students' attitudes toward technology were

found to be influenced by interpersonal factors, that is, teachers and students, along with students and students. For instance, the students might engage in the out-of-class activities through Moodle simply to please the teachers, but the students were reluctant to let their peers know if they were using the online materials in front of the class. The lack of interactions between teachers and students, students and students, nor teachers and teachers were found as the significant obstacles to technology integration into the CFL classrooms. These results indicated that the groups of the students and teachers were nested in the classrooms, in which the classroom teachers acted as an authority of knowledge and education. It appears that teachers take the crucial role with regards to adopting educational technology within the educational system. The teachers decided if technology should be adopted in the classroom settings, also, made choices for the students about what should and should not learn. The preference for teacher-centered methods was unlikely to be change in a relatively short period of time, which can be seen as an obstacle to use CALL to facilitate interactions with students and learning autonomy.

6.2 Implications for Research

As the investigation of the factors affecting teachers' and students' perception of educational technology adoption and use has been found associated with multiple variables, this study hoped to shed light on possible reasons for teachers' resistance to technology. First of all, the quantitative and qualitative results of the study suggest that what the participants reported on the surveys could be different from their interview responses, also, the inconsistency between their words and actions was also observed. That is, what the participants claimed by themselves might vary from what they behaved as the researcher observed in the classrooms and through Moodle logs. For

instance, Teacher A did not agree on the survey item (Q9): "there is a lack of discussion and sharing information about teaching through technology among the teachers," however, in the individual interviews, she revealed that these teachers rarely talked about teaching methods nor exchanged teaching ideas. In this sense, what we can know from the survey data seemed to be limited. Moreover, this study also discovered that the students might tend to take some actions to please their teachers (e.g., leaving the Moodle activity logs to make a good impression on the teacher but did not actually engage in the activities). This might show us the dangers in relying heavily on a single data resource.

Secondly, there is a need for CALL theories, as the study had found that the existing theories could not explain the whole picture of educational technology adoption. Since the field of CALL stretches across technology and SLA, each of the theories seem not to describe the phenomenon appropriately. For instance, TAM and UTAUT might be useful to understand the certain variables that influence users' behavioral intentions to use a certain technology, however, the models ignore that foreign language teachers and learners have specific needs and purpose for using educational technology, and educational contexts might be different from normal settings. As the figures have outlined in the previous section, users of educational technology, specifically, teachers and students are constrained by classroom climate, institutional policies that are influenced by the social and cultural contexts. Therefore, when conducting research regarding educational technology adoption, researchers should be aware that what we can see might be the tip of the iceberg. The extracting variables from the existing framework can limit the factors that we can see.

In this sense, the final implication for research is the need for anthropology studies in CALL field. Because the existing theoretical frameworks are insufficient to explain the certain contextual factors that affect educational technology integration, participating in the context with the participants help understand their behaviors and the sociocultural situations. This study spent more than about two years with the group of the participants, as had been found in the current study, the participants became more willing to reveal their thoughts to the researcher over the time. The results suggested that longitudinal studies are worth conducting, in order to explore what are "under the surface" and "cognitive dissonance." Researchers should also be aware that when a teacher as a researcher conducting research, the trap of "publish or perish," which might cause the researcher to conceal results that appear to be unpleasant. We already have some many studies that intend to prove the effectiveness of CALL technology, claiming that "my students/teachers love to learn/teach with technology" (Felix, 2008). Viewing the results objectively might provide evidence to understand the real-world conditions rather than ideal outcomes. After all, a negative result is still a result. This study might not appear to be a positive one, but it did shed some light on the barriers to educational technology integration in a natural setting.

6.3 Implications for Administration

This study outlines the factors that hampered technology integration into CFL classrooms in the Japanese university context. Understanding the challenges for administration to promote using technology for education may help overcome the barriers, furthermore, may provide teachers and students with a better pedagogical environment, hopefully. In the current study, it has found that the internal barriers were overwhelmingly affected by effective technology implementation compared. Despite

the fact that the external barriers could have been resolved, the teachers were reluctant to accept technical and pedagogical support due to the complex factors. It might not be hard to observe that even the institutions provided the teachers with sufficient facilities (e.g., CALL devices, Wi-Fi assessments, LMS) in the classrooms, the teachers rarely used any of it or had limited usage.

Previous studies have suggested that institutions offer teacher training in technology skills and provide teachers with technical support. However, the study found that what the teachers needed more were teaching support and psychological support. Lacking experience and skills of using CALL methods, even the teachers were able to use computers, they did not know how to apply their teaching practices. Despite the fact that the university had its technical support team, the teachers regarded it as a group of "non-expert" faculty and did not want them to interfere with their teaching. These highlight the needs for CALL experts, who are specialized in both technology and language teaching fields, to help language teachers in educational institutions. Since language classes are so different from the normal lecture classes, what language teachers need for support might be different from the "one size fits all support center." Also, previous negative experiences with the CALL system might hamper teachers' expectations for new technology, for fear that the role of teacher might be taken away by technology. Therefore, when institutions are trying to promote a certain technology, or to replace the previous system with the new one, it may be helpful to explain the reasons for implementation and explain the differences between the technologies.

More important, institutions need to be aware of teachers' internal barriers. It was surprising to find that the teachers in the same department rarely discussed their teaching statement, nor sharing teaching methods or experience within the potential

teacher community. In such an up-down ecological environment, how to facilitate teachers to work together with no threat to "hurt the harmony" appears to be a challenge for the institutions as well. The characters of the social-cultural context seem unlikely to be changed, however, providing teachers with a comfortable workplace with no fear of "losing face" might help teachers become more willing to develop their professional skills. As the study has found, the teachers, were more inclined to ask for teaching advice outside the existing teacher community or to solve teaching problems by themselves. Therefore, institutions may help organize consulting groups for teachers or provide resources for teachers' professional development.

Additionally, institutions should also provide ongoing training for teachers to facilitate technology utilization in the workplace. Having not received training in foreign language education nor in technology use, the teachers in this study tended to teach by their classroom experiences or to teach in the ways that they had been taught. Thus, the lack of knowledge in SLA appears to be the more urgent problems before technology adoptions. When inquiring how the teachers expected technology could help them with the current teaching practices, as the study had found, it seems that the teachers did not know what they wanted, but they knew what they did not want. With the strong beliefs about how language teaching and learning should be (e.g., the myths of standard language, perfected pronunciation, native speakerism), the teachers regarded Moodle as a platform for digitizing the textbooks' contents and audios.

The end goals for institutions should not merely be increasing adoption of classroom technology on a larger scale but should be using technology to enhance a positive educational environment for faculty and students. If not, perhaps we should not have unreasonable expectations for technology since what has not been done in the real world

might not miraculously appear in the virtual world. That is, if the teachers and students lack interactions in the classrooms and workplaces, they are unlikely to enthusiastically communicate through technology like LMS or SNS. In a similar vein, teacher-centered classrooms will not switch to student-centered environments simply with the use of technology.

The main conclusion can be drawn in this section is that governments and institutions should be more aware of the purpose of promoting educational technology. It should not be a competition among countries to compare who use technology more in the classroom, after all, it is quality not quantity that counts. How and what educators use for teaching and the outcomes matter. As this study revealed, even the only teacher adopted Moodle and online teaching materials, the usages remained in a traditional way. Thus, how to encourage teachers to utilize educational technology as administration expects might be an ongoing challenge. When establishing institutional policies regarding technology implementation, it might be helpful if both teachers and students can take part in the decision processes. Listening to teachers' and students' voices might also help understand the actual conditions and difficulties in technology integration.

6.4 Implications for Pedagogy

The key to success for educational technology integration into foreign language classes may be teachers, who play the crucial role in the educational settings. As this study suggests, the teachers made all decisions for the students regarding what materials to use, and what approaches to teach whether with or without technology. Only if teachers value technology can it be successfully utilized, at least, as the government and institutions expected (see Chapter 2 for the MEXT policy). The potential of technology

may be overestimated by the government and be underestimated by teachers with the lack of professional knowledge in terms of CALL. It is not technology's fault but the humans.' With the lack of knowledge of technology and SLA, teachers may have limited usage, as the teachers perceived Moodle as a platform for digitizing textbooks and rarely adopt the social learning activities with it.

In this study, it seems that the experienced in-service teachers were satisfied with their current teaching, which might become the main obstacles to accepting new teaching methods. Their beliefs about teaching and learning seemed to be established in the early stage of their career, moreover, there were not urgent needs for them to change the existing teaching practices. Since the teachers did not only have to do teaching work, but also administrative work and research, integrating educational technology into the classrooms might gain their workload, which means that they had to change the existing syllabus and adjust the current teaching styles. As a consequence, reluctance to technology might be a safe way for the experienced teachers. However, as this study suggested, the more "new methods" Teacher D tried, the more questions about teaching and learning he found. This may provide the positive evidence that using technology for teaching might not reduce teachers' workload, but it provides teachers with an opportunity to reflect their existing teaching.

Stepping out of their comfort zone, teachers may find that the fear is fictional. As this study suggested, the students were not as confident with their digital skills as the teachers expected, moreover, they still need teachers to filter out appropriate learning materials on the internet and look for teachers' supports. Students may be familiar with technology, but they do not know how to use it for language learning. We should keep in mind that the students now may be teachers in the future, which means that they may

teach in the way that they have been taught someday. Afterall, teachers' attitudes toward new methods affect students' perceptions in some sense. If teachers are more willing to try different teaching methods, students may benefit from various learning strategies that meet their needs and interests. Also, teachers should provide students with not only language knowledge, but also technical support and psychological support. If teachers come with preconceived notions that students lack motivation of learning, it is unlikely to create a motivating learning environment. Teachers should give students more control over their learning and encourage students to learn with technology, which provides them with a chance to practice learning autonomy. In saying this, some of the comments made by the teachers indicated that there was perhaps a fear of job security as a result of technology taking over the teaching practices that they were currently engaged in, and as such tended to reject technology to cause students to maintain a higher level of reliance on them, thereby potentially restricting the development of autonomy. As technology takes on a more prominent position in language pedagogy, the role of teacher as provider of knowledge is likely to shift to one in which they try to encourage autonomy, where they provide the skills that the learners need to be able to study without direct supervision to achieve language learning goals that go beyond the immediate course of study.

Last but not least, traditional teacher's roles may be challenged by educational technology, but every teacher and teacher-to-be should all be prepared to use technology for teaching. Teachers should be aware that technology will definitely not replace teachers, but teachers who do use technology may be. Moreover, in-service teachers should be open minded to learn up-to-date SLA theories and trends, which can help integrate technology into teaching practices in more effective ways. Otherwise,

technology becomes simply a tool to make existing teaching look 'fancy' but there is no gain in trying to improve education actually.

6.5 Limitations of the Study

This study used multiple instruments to explore the factors affecting teachers and students on their intention and actual behaviors around educational technology integration into CALL classrooms. It should be noted that the study is not without limitations, including (1) the role of the researcher, (2) the sampling methods, and (3) other realistic considerations.

First, the researcher intended to be a complete observer in the classroom settings to understand the CFL education environment, however, the teachers inclined to let the researcher participate in the teaching activities inside the classrooms. As a consequence, the researcher's role might affect the results in some sense as the teacher and student participants gained trust with the researcher and became more willing to reveal their real thoughts over time. It is unlikely to examine if the researcher became one of the social "factors" that impact the participants' attitudes toward Moodle and the online materials, though the researcher did not explicitly inform the participants that their engagements on Moodle were observed. Any researchers replicate this study should be aware that the results may differ depending on the relationship built between the participants and the researcher.

Another two limitations of this study may be linked to the first one. Since the researcher did not teach any of the CFL classes, it was difficult for the researcher to find students to volunteer to take part in the interviews. Only the students who were already

motivated to learn Chinese and the students who had engaged in the Moodle materials participate in the interviews, thus, the interview results might not represent all students' voices. However, at the same time, this circumstance may remind us that the research bias of volunteering sampling methods may cause. Also, although training students in Moodle use and providing ongoing technical support were extremely important in CALL environments, the researcher had limited access to the students. Interactions with the students were limited during the formal class time, and any training took place in the classrooms should be approved by the teachers. Since the researcher did not intend to interrupt their formal course time, interactions with the students only took place after the classes face-to-face or through email and Moodle.

Moreover, due to the realistic considerations, the researcher was unable to observe every single class of the four teachers. Thus, it was not clear if the teachers had changed their teaching behaviors due to the awareness of being observed. In other words, the teachers might use educational technology in the classroom simply to "show" the researcher but did not use the technology when the researcher was absent. Again, although the researcher had made effort to maintain careful neutrality throughout the study, the existing beliefs about CALL and the role as the researcher (rather than a teacher as a researcher) might make an impact on the results.

6.6 Recommendations for Future Research

Based on the limitations of this study, here are some suggestions for future research. First of all, this study did not attempt to generalize teachers' and students' perception around educational technology use in CFL classrooms to all universities in Japan, but rather to provide a contextualized understanding of the current statement in a certain

CFL teaching/learning context. This suggests that further research investigating various groups of teachers and students within different contexts may be helpful to gain broader understanding regarding educational technology integration. Moreover, it is interesting to see if there are any variables regarding socio-cultural differences/similarities in the settings. As different groups of teachers and students may have different CALL ecology, and the educational policies and issues differ, research carried out in varied contexts is worthwhile.

Secondly, as the current study was conducted by a researcher, the researcher was unable to attend the four teachers' every class. Thus, it suggests that future studies may carry out similar longitudinal investigation with multiple researchers, thus, the observation can be conducted with larger sample size, and more in-depth data can be gathered and analyzed at the same time. Also, regarding the constraints of the researcher's role, it is suggested that future studies considering conducting similar research may find more students to participate in the interviews to find out more students' external factors.

Finally, there are a number of studies looking at teachers' and students' attitudes towards CALL, however, the target languages seem to be English dominant. As the current study has found that the participants' perceptions of technology into CFL classrooms were affected by their previous English learning/teaching experiences, it may be necessary to investigate teachers' and students' perceptions around CALL for learning/teaching other languages, in order to determine if the third language makes impacts on CALL adoption. Also, research into non-native teachers' perception seems to be scarce. Future studies may investigate if there is a difference between native teachers' and non-native teachers' attitudes towards CALL.

6.7 Final Remarks

"[T]eachers are not empty vessels waiting to be filled with theoretical and pedagogical skills; they are individuals who enter teacher education programs with prior experiences, personal values, and beliefs that inform their knowledge about teaching and shape what they do in their classrooms."

(Freeman & Johnson, 1998, p. 401)

I would like to close this study with this quotation to remind us of the crucial role for teachers especially in the 21st century. Although this study was carried out immediately before the COVID-19 pandemic in 2020, the changing roles of teachers, students, and technology highlight the significance of this study, which urges the importance of ongoing training for in-service teachers. Once the pandemic started, the teachers and students who participated in this study were "forced" to use technology for CFL education due to the unprecedented situation. The teachers had resisted using technology for teaching, but then they had no choice but to adopt the LMS and video conferencing for remote teaching. However, we should not be satisfied with the diffusion of educational technology used all over the world, after all, the quality of education matters. Once we return to "normal life," will teachers continue their teaching practices with the use of technology? And more importantly, does technology really enhance education?

The follow-up study showed that the teachers felt regret that they had not practiced how to use Moodle and online tools with the researcher's support. Although the researcher was always willing to help the teachers, they rarely asked for help, as the current study indicated, the teachers neither turned to the technical support team provided by the

university. How to provide teachers with support and training seems to be challenging for institutions in similar social-cultural backgrounds.

Technology is shaping the educational environment, but teachers who are resist taking on the new roles seem to be unlikely to change. Traditional teacher roles seem to be an obstacle to the potential of CALL, due in part to the fear that their authority will be taken by technology. However, this leads us to ask what the purpose of education is? And who should be in the center of education? The term CALL seems to answer these questions, as it stands for computer "assisted" language "learning," instead of "assisted" language "teaching." It may be the time to give students control over their learning. This study hopes to shed light on the urgent needs for professional development in teacher education. It is also hoped that this study investigated how teachers and students perceive technology for CFL education may provide insights for policymakers, educators, and learners to prepare for successful technology integration.

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Appendix A

PISA 2018: Digital devices used in foreign language classrooms across OECD countries
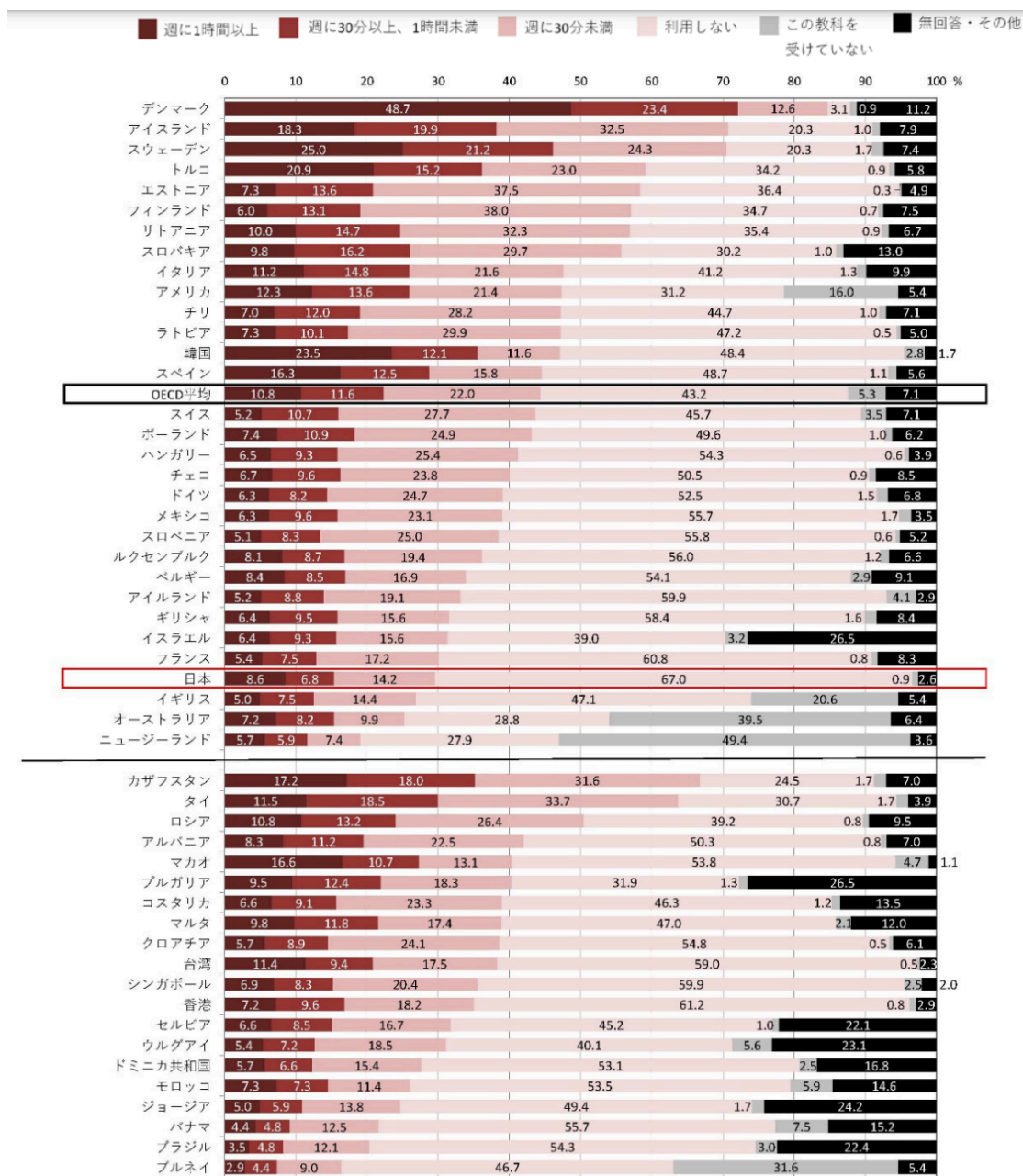
(Retrieved from https://www.nier.go.jp/kokusai/pisa/pdf/2018/06_supple.pdf)

Appendix B

Teacher Pilot Survey

【教師アンケート】

Q1. お名前：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

（名字／Name）

Q2. 中国語を教えた経験はどのくらいですか？ ＿＿＿＿＿年

（您教汉语多长时间了？／How long have you been teaching Chinese?）

Q3. 何のデバイスが持っています？

（您有哪种数码装置？／What device(s) do you have?）

□卓上コンピュータ(台式电脑／desktop)　　□ノートパソコン(笔记本电脑／laptop)

□タブレット(平板电脑／tablet)　　　　□スマートフォン(智能手机／smartphone)

□ガラケー（折り畳み式携帯電話）(翻盖手机／flip phone)

Q4. ICT（情報通信技術）を利用して、中国語を<u>学習した</u>経験がありますか？

（您用信息通信技术学习过汉语吗？／Have you ever used technologies to learn Chinese?）

□無し（没有／No）

□有る：Q5、Q6 も答えてください（有:请接着回答 Q5,Q6/Yes: Please answer Q5, Q6 as well）

Q5. 何を使いましたか？ （您使用了什么？/ What did you use?）

□PPT(Power Point)　　　□CD　　　□ビデオ（视频／video）　　　□email

□電子辞書（电子词典／electronic dictionary）　　□ソフトウエア（软件／software）

□ウェブサイト（网站／website）　　　□アプリ（手机应用软件／mobile application）

□その他:＿＿＿＿＿＿＿＿

Q6. ICT（情報通信技術）を利用して、何を<u>学習</u>しましたか？

（您用信息通信技术学习什么？／What did you learn with technologies?）

□単語（单字／vocabulary）　　□文法（语法／grammar）　　□リスニング（听力／listening）

□スピーキング（口说／speaking）　　　　□リーディング（阅读／reading）

□ライティング（写作／writing）　　　□その他:＿＿＿＿＿＿＿＿

Q7. ICT を利用して、中国語を<u>教えた</u>経験がありますか？

（您用信息通信技术教过汉语吗？／Have you ever used technologies to teach Chinese?）

☐無し（没有／No)

☐有る：Q8、Q9 も答えてください（有:请接着回答 Q8,Q9/Yes: Please answer Q8, Q9 as well)

Q8. 何を使いましたか？（What did you use?)

☐PPT (Power Point)　　　☐CD　　　☐ビデオ（视频／video)　　　☐email☐電子辞書（电子词典／electronic dictionary)　☐ソフトウエア（软件／software)

☐ウェブサイト（网站／website)　　　☐アプリ（手机应用软件／mobile application)

☐現在使っている LMS（The existing LMS)　　☐その他:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Q9. 何を**教えました**か？(您**教**什么？／What did you **teach**?)

☐単語（单字／vocabulary)　　☐文法（语法／grammar)　　☐リスニング（听力／listening)☐スピーキング（口说／speaking)　　　　☐リーディング（阅读／reading)

☐ライティング（写作／writing)　　　☐教室管理（教室管理／classroom management☐その他:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Q10. 提示された文にどの程度合意できるかを評価してください。☑

（请根据叙述选择您的赞同程度。／Please rate how strongly you agree or disagree with each of the following statements.)

		非常に同意できる	同意できる	どちらともいえない	同意できない	全く同意できない
1	自分の ICT スキルに自信を持っています。 (我对自己的信息通信技术技能有信心。／I am confident with my technological skills.)					
2	私にとって ICT を用いて教育活動の学習は簡単です。 （学习使用信息通信技术来教学对我来说很容易。／Learning to teach with technologies would be easy for me.)					
3	ICT は私の授業に役に立つと信じています。(我相信信息通信技术对我的教学有帮助。／I believe technologies are useful in my teaching.)					
4	ICT を活用することで、教育活動を行うことに興味があります。(我对使用信息通信技术进行教学有兴趣。／I am interested to use technology in teaching.)					
5	ICT を活用することで、教室管理は楽になると思います。(我认为透过信息通信技术进行教室管理会变得轻松。／I think classroom management will be easier by using technologies.)					
		非常に同意できる	同意できる	どちらともいえない	同意できない	全く同意できない
6	ICT を用いて教育活動を行うことは負担になると思います。例えば：時間かかる、仕事量増加。 (我认为用数码科技来从事教育目的会增加负担(如：耗时，工作量增加)。／I think using ICT for pedagogical purpose will gain more effort (e.g. time consuming, heavier workload).)					
7	現在の教育方法に満足しています。(我满足于目前的教学方法。／ I am satisfied with my current teaching.)					
8	金銭的或いは技術的なサポートは足りない。 (我缺乏金钱上或技术上的支援来进行信息技术融合教学。／I lack financial or technological support for integrating ICT into teaching and learning.)					
9	学校の教師間に、ICT のシェア、討論と支援は足りない。					

	（学校缺乏教师间对信息技术教学的分享、讨论和支援。／There is a lack of ICT-related sharing, discussion, or support among CFL teachers in this school.）					
10	学生は ICT 化の学習に興味が持つと思います。 （我认为学生对信息通信技术融合教学有兴趣。／I think students are interested to use technology in learning.）					
11	ICT を活用することで、学生の学習動機付けを高めると信じています。(我相信学生能通过信息通信技术提升学习动机。／I believe using ICT could facilitate students' motivation.)					
12	ICT を活用することで、学生は授業外も中国語と中国語圏文化が触れると信じています。(我相信学生能通过信息通信技术，在课外获取汉语和华人文化的知识。／I believe students can get access to Chinese language and culture outside of classroom with the use of ICT.)					
13	適切なオンライン教材を選び方がわかります。 （我知道如何选择恰当的线上教学材料。／I know how to select appropriate online materials for teaching and learning.）					
14	ICT を活用することで、学生の学習状況を把握することを心配しています。 （我担心使用信息通信技术会变得难以掌握学生的学习。／I feel apprehensive about using ICT will be difficult to control students' learning.）					
15	学生に ICT を使って学習の目的に達す訓練方法がわかります。 （我知道怎么训练学生使用信息通信技术来达成学习目的。／I know how to train students to use technologies for pedagogical purpose.）					

Appendix C

Student Pilot Survey

【学生アンケート】

クラス：＿＿＿＿　　学籍番号：＿＿＿＿＿＿＿＿＿　　お名前：＿＿＿＿＿＿＿＿＿＿＿＿

【第一部分】中国語の学習背景（以下の情報を空欄にご記入ください。）

Q1. 中国語の学習期間：＿＿＿＿＿年＿＿＿＿＿月

Q2. 中国語を選んだ理由：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Q3. 中国語を勉強する目標：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Q4. 中国語や中国語圏に何の関心が持っていますか？（複数選択可）

　　　□発音　　　　　□会話　　　　　□読解　　　　□検定(HSK、中検など)　　　□学習方法

　　　□時事　　　　　□歴史　　　　　□文学　　　　□古代文化　　　　□若者文化　　　□旅行

　　　□その他：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

【第二部分】ICTを利用した学習経験について（貴方ご自身のことについてお答え下さい。）

Q5. 何のICT（情報通信技術）デバイスを持っていますか？（複数選択可）
　　　□卓上コンピュータ　　　　□ノートパソコン　　　　□タブレット
　　　□スマートフォン　　　　　□ガラケー

Q6. ICT（情報通信技術）を利用して、中国語を学習した経験がありますか？
　　　□無し
　　　□有る：Q7、Q8 も答えてください

Q7. 何を使って、中国語を勉強しましたか？（複数選択可）
　　　□PPT　　　　　□CD　　　　□ビデオ　　　　□email　　　　□電子辞書
　　　□ソフトウェア　　　　□ウェブサイト　　　　□アプリ

□その他：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Q8. ICT（情報通信技術）を利用して、何を学習しましたか？（複数選択可）
　　□単語　　　　　　　□文法　　　　　　□リスニング　　　　　□スピーキング
　　□リーディング　　　　□ライティング　　　□その他：＿＿＿＿＿＿＿＿＿

【第三部分】提示された文にどの程度合意できるかを評価してください。（該当する項目に

チェックを入れてください。☑）

		非常に同意できる	同意できる	同意できない	全く同意できない
Q9.	授業の後、ICT（情報通信技術）を利用して中国語を学習したいです。				
Q10.	自分で適切なオンライン中国語教材を検索することができます。				
Q11.	自分でオンライン中国語教材を使うことができます。				
Q12.	先生が適切なオンライン中国語教材提供したらいいと思います。				
Q13.	授業の後、ICT を利用して先生と交流したいです。（例えば：email, LINE, Facebook, Twitter, The existing LMS…）				

以上でアンケートは終わりです。
ご協力いただきまして、ありがとうございました。

谢谢！

Appendix D

Pre-survey

このアンケートは卒業論文の研究ための調査です。　あなたの成績評価には、一切影響しませんので、率直に答えてください。なお、お預かりした個人情報は目的以外には一切使用しません。

【学生アンケート】

クラス：＿＿＿＿　　学籍番号：＿＿＿＿＿＿＿＿＿　　お名前：＿＿＿＿＿＿＿＿＿＿＿＿

（システム登録用ので、丁寧に書いてください）

Eメール：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

【第一部分】中国語の学習背景

（以下の情報を該当する項目にチェックを入れてください。☑／空欄にご記入ください。）

Q1．中国語の学習経験：□ない　　□有り：＿＿＿＿年＿＿＿＿月

Q2．中国語を選んだ理由：（複数選択可）

□将来よい仕事を見つけるため　　□自分の視野を広げるため　□より良い自分になるため

□中国語圏の文化に興味がある　　　□中国の文学に興味がある

□中国語圏の大学へ留学したいため　□中国語圏の国へ旅行する時に便利なので

□中国語圏の人と友達になるため　　□バイト先の中国語圏の同僚に交流したい

□家族の影響で　　　　　　　　　　□知り合いも中国語を学んでいるので

□難しい外国語に挑戦したいのでいので　　□中国語は英語や他の外国語より勉強しやすい

□中国語と日本語はどちらも漢字があるので　　□中国語の授業の単位は取得しやすいので

□その他：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿　　□特にない

Q3．中国語を勉強する目標：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Q4. 中国語や中国語圏に何の関心が持っていますか？（複数選択可）

☐発音　　　　☐文法　　　　☐聞く　　　☐話す　　　☐読む　　　☐書く

☐試験(HSK、中検など)　☐学習方法　☐時事　　　☐歴史　　　☐文学

☐文化　　　☐旅行　　　☐ドラマ　　☐映画　　　☐漫画　　　☐歌

☐その他：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿　☐特にない

【第二部分】ICT（情報通信技術）を利用した学習経験について

（貴方ご自身のことについてお答え下さい。）

Q5. 何のデバイスを持っていますか？（複数選択可）

☐卓上コンピュータ　　　☐ノートパソコン　　　☐タブレット

☐電子辞書　　　　　　☐スマートフォン　　　☐ガラケー

Q6. ICT（情報通信技術）を利用して、外国語を学習した経験がありますか？

☐無し

☐有る：Q7、Q8 も答えてください

Q7. 何を使って、外国語を勉強しましたか？（複数選択可）

☐PPT　　　　☐CD　　　☐ビデオ　　　　☐email　　　☐電子辞書

☐ウェブサイト　☐ソフトウェア（パソコンの）　☐アプリ（スマホン・タブレット

の）

☐その他:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Q8. ICT（情報通信技術）を利用して、何を学習しましたか？（複数選択可）

☐単語　　　　☐文法　　　☐リスニング　　　☐スピーキング

☐リーディング　☐ライティング　☐その他:＿＿＿＿＿＿＿＿＿＿＿＿＿

【第三部分】提示された文にどの程度合意できるかを評価してください。

（該当する項目にチェックを入れてください。☑）

		非常に同意できる	同意できる	同意できない	全く同意できない
Q9.	授業中、ICT（情報通信技術）を利用して中国語を学習したいです。				
Q10.	授業の後、ICT（情報通信技術）を利用して中国語を学習したいです。				

Q11.	自分で適切なオンライン中国語教材を検索することができます。				
Q12.	自分でオンライン中国語教材を使うことができます。				
Q13.	先生が適切なオンライン中国語教材提供したらいいと思います。				
Q14.	授業の後、ICT を利用して先生と交流したいです。（例：email, LINE, Facebook, Twitter, The existing LMS…）				

以上でアンケートは終わりです。

ご協力いただきまして、ありがとうございました。

谢谢！

Appendix E

Mid-survey

> このアンケートは卒業論文の研究ための調査です。　あなたの成績評価には、一切影響しませんので、率直に答えてください。なお、お預かりした個人情報は目的以外には一切使用しません。

【学生アンケート】

クラス：_____　　学籍番号：_____　　お名前：_____

【第一部分】

（以下の情報を該当する項目にチェックを入れてください。☑ ; 空欄にご記入ください。）

Q1. 中国語の授業外、何を勉強したいですか？ （複数選択可）

☐発音　　　　☐文法　　　☐聞く　　　☐話す　　　☐読む　　　☐書く
☐試験(HSK・中検など)　　☐学習方法　☐時事　　　☐歴史　　　☐文学
☐文化　　　　☐旅行　　　☐ドラマ　　☐映画　　　☐漫画　　　☐歌
☐その他：_____　　　　☐特にない

Q2. 中国語の学習に取り組む際に困ったことの解決方法：（複数選択可）

☐自分で考える　　　☐インターネットで調べる

☐誰かに相談する（☐友達、同級生　☐先輩　☐中国語ネイティブ　☐授業を担当する教員

☐授業の担当とは別の教員　　☐その他_____）

☐何もしない　　☐その他：_____

Q3. 今までにMoodleを利用したことがあるか？

☐有り（理由：_____）

☐無し（理由：_____）

Q4. Moodleの内容に関するご感想、ご意見、ご要望（追加してほしい内容など）：

【第二部分】提示された文にどの程度合意できるかを評価してください。

（該当する項目にチェックを入れてください。☑)	非常に同意できる	同意できる	同意できない	全く同意できない
Q5. 自分の ICT（情報通信技術）スキルに自信を持っている。				
Q6. 私にとって ICT を用いて、中国語を学習するのは簡単だと思う。				
Q7. ICT を活用することで、学習動機付けを高めると信じている。				
Moodle を活用することで、学習動機付けを高めると信じている。				
Q8. ICT を活用することで、授業外も中国語と中国語圏文化が触れると信じている。				
Moodle を活用することで、授業外も中国語と中国語圏文化が触れると信じている。				
Q9. 授業中、ICT を利用して中国語を学習したいと思う。				
授業中、Moodle を利用して中国語を学習したいと思う。				
Q10. 授業の後、ICT を利用して中国語を学習したいと思う。				
授業の後、Moodle を利用して中国語を学習したいと思う。				
Q11. 自分で適切なオンライン中国語教材を検索することができる。				
Q12. 自分でオンライン中国語教材を使うことができる。				
Q13. 先生が適切なオンライン中国語教材提供したらいいと思う。				
Q14. 授業の後、SNS を利用して先生と交流したいと思う。				
授業の後、Moodle を利用して先生と交流したいと思う。				
Q15. ICT は私の学習に役に立つと信じている。				
Moodle は私の学習に役に立つと信じている。				
Q16. ICT を活用することで、学習活動を行うことに興味がある。				
Moodle を活用することで、学習活動を行うことに興味がある。				
Q17. ICT を活用することで、学習管理は楽になると思う。				
Moodle を活用することで、学習管理は楽になると思う。				
Q18. ICT を用いて学習活動を行うことは負担になると思う。（例：学習の時間や量の増加など）				
Moodle を用いて学習活動を行うことは負担になると思う。（例：学習の時間や量の増加など）				
Q19. 現在の学習方法に満足している。				
Q20. 現在の授業内容、指導方法に満足している。				

（該当する項目にチェックを入れてください。☑）	非常に同意できる	同意できる	同意できない	全く同意できない
Q21. ICT を活用して、教員が学生の学習状況を把握することを心配している。				
Moodle を活用して、教員が学生の学習状況を把握することを心配している。				
Q22. 教員はeティーチング（ICT 活用教育）に興味が持つと思う。				
Q23. 教員は ICT を活用して指導する能力があると思う。				
Q24. この学校のeラーニング環境整備（金銭的、技術的なサポート）は足りないと思う。				
Q25. 学生の間に、eラーニングのシェア、討論と支援は足りない。				

 みなさんの「声」を直接に聞かせてくれませんか？

（所要時間は約 20 分程度です。インタビュー後、プレゼントをお渡しさせていただきます。）

□インタビューを希望する　　　□インタビューを希望しない

以上でアンケートは終わりです。
ご協力いただきまして、
ありがとうございました！

Appendix F

Post-survey

このアンケートは卒業論文の研究ための調査です。　あなたの成績評価には、一切影響しませんので、率直に答えてください。なお、お預かりした個人情報は目的以外には一切使用しません。

【学生アンケート】

学籍番号：＿＿＿＿＿＿＿＿＿＿＿＿　　お名前：＿＿＿＿＿＿＿＿＿＿＿＿

【第一部分】

（以下の情報を該当する項目にチェックを入れてください。☑；空欄にご記入ください。）

Q1. 来学期中国語の授業も取りますか？

　　□取る（理由：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿）

　　□取らない（理由：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿）

Q2. 中国語学習の動機を付けるもっとも重要なことは何だと思いますか？

　　□自分の目標　　□教員の指導　□友達、同級生と協働/協調学習　□中国人と交流

　　□教材　　　　　□中国の文化　　　□学習の楽しさ　　　　□学習環境、整備

　　□その他：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿　□考えたことはない

Q3. 中国語の授業外、自分で何を勉強しましたか？（＊複数選択可）

　　□聞く　　　□話す　　　□読む　　　□書く　　□翻訳、通訳　　□文法　　□単語

Q4. 以上の選択は何を使って勉強しましたか？

　　＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Q5. 授業外、中国語の学習に取り組む際に一番よく使うツールは何ですか？

　　□教科書以外の本　　　□辞書(紙製)　□電子辞書　　□スマホンのアプリ

　　□Google 翻訳（□スマホン上、□パソコン上）

　　□ウェブ検索（□スマホン上、□パソコン上）

　　□その他：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿　　□何もしない

Q6. 普段よく使う SNS、動画サイトは何ですか？（＊複数選択可）

　　□LINE　　　　□Instagram　　□Facebook　　　□Twitter　　□TikTok　　□mixi

　　□YouTube　　□NetFlix　　　□ニコニコ動画　　□Bilibili

　　□その他：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿　　□全く使っていない

Q7. 以上の選択を使用して中国語を学習したことがありますか？

□有り　　□無し

Q8. SNS、動画サイト等を利用して中国語の学習に興味がありますか？

□有り　　□無し

Q9. 今までにMoodleを利用して中国語を学習したことがありますか？

□有り（何を使った：_____）

□無し（理由：_____）

Q10. Moodleに関するご感想、ご意見（内容、操作方法など）

【第二部分】提示された文にどの程度合意できるかを評価してください。

	（該当する項目にチェックを入れてください。☑）	非常に同意できる	同意できる	同意できない	全く同意できない
Q11.	自分の ICT（情報通信技術；例：スマートフォンやコンピュータの使用）スキルに自信を持っている。				
Q12.	私にとって ICT を用いて、中国語を学習するのは簡単だと思う。				
Q13.	ICT を活用することで、学習動機付けを高めると信じている。				
	Moodle/The existing LMS を活用することで、学習動機付けを高めると信じている。				
Q14.	ICT を活用することで、授業外も中国語と中国語圏文化が触れると信じている。				
	Moodle/The existing LMS を活用することで、授業外も中国語と中国語圏文化が触れると信じている。				
Q15.	授業中、ICT を利用して中国語を学習したいと思う。				
	授業中、Moodle/The existing LMS を利用して中国語を学習したいと思う。				
Q16.	授業の後、ICT を利用して中国語を学習したいと思う。				
	授業の後、Moodle/The existing LMS を利用して中国語を学習したいと思う。				
Q17.	自分で適切なオンライン中国語教材を検索することができる。				

（該当する項目にチェックを入れてください。☑）	非常に同意できる	同意できる	同意できない	全く同意できない
Q18. 自分でオンライン中国語教材を使うことができる。				
Q19. 先生が適切なオンライン中国語教材提供したらいいと思う。				
Q20. 授業の後、SNS を利用して先生と交流したいと思う。				
授業の後、Moodle/The existing LMS を利用して先生と交流したいと思う。				
Q21. ICT は私の学習に役に立つと信じている。				
Moodle/The existing LMS は私の学習に役に立つと信じている。				
Q22. ICT を活用することで、学習活動を行うことに興味がある。				
Moodle/The existing LMS を活用することで、学習活動を行うことに興味がある。				
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Q24. ICT を用いて学習活動を行うことは負担になると思う。（例：学習の時間や量の増加など）				
Moodle/The existing LMS を用いて学習活動を行うことは負担になると思う。				
Q25. 現在の学習方法に満足している。				
Q26. 現在の授業内容、指導方法に満足している。				
Q27. ICT を活用して、教員が学生の学習状況を把握することを心配している。				
Moodle/The existing LMS を活用して、教員が学生の学習状況を把握することを心配している。				
Q28. 教員は e ティーチングに興味が持つと思う。				
Q29. 教員は ICT を活用して指導する能力があると思う。				
Q30. この学校の e ラーニング環境整備（金銭的、技術的なサポート）は足りないと思う。				
Q31. 学生の間に、e ラーニングのシェア、討論と支援は足りない。				
Q32. この学校は、学生の ICT 活用学習力の養成を行うべきだ。				
Q33. この学校は、教員の ICT 活用指導力の研修を行うべきだ。				

 みなさんの「声」を直接に聞かせてくれませんか？

＊所要時間は約 20 分程度です。希望者のご都合の良い時間に合わせます。

＊インタビュー後、プレゼントをお渡しさせていただきます。

□インタビューを希望する　　　□インタビューを希望しない

Appendix G

Introduction of Moodle Usages in the Workshop

今日の流れ

一、	登録方法	1. 2018 年 9 月のメール（件名：Waseda Chinese Moodle: 新しいユーザアカウント）で、ユーザ名と一時パスワード確認してください。 2. ウェブサイトにログインしてください。https://chinesemoodle.com/ 3. パスワードを変更してください。
二、	機能紹介	**1. 宿題、評価** • 課題：教師はタスクの伝達、作業の収集、評点およびフィードバックを提供することができます。 • 小テスト：多肢選択問題、組み合わせ問題、記述問題および数値問題を含む様々なタイプの問題を含む小テストを作成することができます。 • ワークショップ：学生のワークを収集、レビューおよび相互評価することができます。 **2. 調査** • フィードバック：教師は多肢選択、○/×またはテキスト入力を含む様々な質問タイプを使用して参加者からフィードバックを収集することのできる独自調査を作成することができます。 • 投票：教師は単一の質問をたずねることおよび複数の一連の回答を提供することができます。 • 調査：オンライン学習環境における評価および刺激に関して有益であると検証された多くの調査手段を提供します。 3. 交流 • チャット：参加者はテキストベースのリアルタイム同時ディスカッションを実施することができます。 • フォーラム：参加者は非同期にディスカッションすることができます。例) 長期間に及ぶディスカッション。 **4. 協同作業** • Wiki：参加者が一群のウェブページを追加および編集することができます。Wiki は個人または誰でも編集することのできる協力的な場です。誰でも自分たちだけが編集できる自分の Wiki を持つことができます。 **5. 参考資料**

- URL ：教師はコースリソースとしてウェブリンクを提供することができます。

- ファイル ：教師はコースリソースとしてファイルを提供することができます。

- フォルダ ：教師は多くの関連ファイルを単一のフォルダ内に表示することができます。

三、	示範コース	
四、	討論	1. どの機能を使ってみますか？
		2. How will you integrate these functions into your teaching?
五、	Q&A	

Appendix H

Classroom Observation Scheme

Date:_____ **Class:**_____ **Teacher:**_____

Numbers of students:_____

1. Materials use

2. Teaching procedure

3. Classroom activity: pair work, group work

4. Student response and engagement

5. Interaction: teacher-student, student-student, student-teacher

6. Atmosphere

7. In-class language use, rules, seat arrangement

8. Assignment

9. Evaluation

10. Interaction: researcher-teacher

Appendix I

Interview Questions for Students after One Semester of Moodle Implementation

【学生インタビュー問題①】

1. Moodle のウェブサイト／アプリを使用したことはありますか？何の内容、機能が

よく使いますか？

無しの場合は、それは何故ですか？

Did you use Moodle website or application?

If so, what contents and what functions did you use?

If not, what are the reasons?

2. **Moodle（ウェブサイト／アプリ）を使用する上で苦労したことがありましたか？普段いつ、どこで使っていますか？**

   Did you find any difficulties with using Moodle (website/application)? When and where do you usually use?

3. パソコンやスマートフォン（**ICT**）を利用して教科書以外の内容を学習することは、どう思いますか？

   How do you think about using PC, smartphone to learn Chinese other than textbook?

4. 中国語を学ぶにあたって、学生の役割とは何だと思いますか？

   What is the role of students in Chinese learning?

5. 中国語を学ぶにあたって、先生の役割とは何だと思いますか？

   What is the role of teachers in Chinese learning?

6. 中国語を学ぶにあたって、**ICT** の役割とは何だと思いますか？

What is the role of technologies in Chinese learning?

7. アンケートの詳細について

About survey

Appendix J

Interview Questions for Teachers after One year of Moodle Implementation

【教員インタビュー問題】

1. 普段の日常生活で **ICT**（パソコン、スマホ等）をお使いになりますか？

What are the uses of technology in your daily life?

2. **Moodle** を使っていますか？何故ですか？

Are you using Moodle? Why or why not?

3. **Moodle を使う時、何か難しいことや心配なことはございますか？操作が難しいか分かりにくいことがあるかどうか?**

   What difficulties had you found or concerned about when using Moodle (or ICT)?

4. **The existing LMS を使ったことございますか？もしあれば、何をお使いになりましたか？**

   Have you ever used The existing LMS? What were the purposes of using it?

5. **本学は来学期から Moodle を導入することをご存知でしょうか？どこからこの情報を得たのですか？**

   Do you know the university will start using Moodle from next semester? Where did you get the information?

6. **来学期から Moodle をお使いになりますか？理由を伺ってもよろしいでしょうか？**

   Will you apply Moodle from next semester? What is your reason?

7. **ICT を通じる語学指導方法の研修を受けたことはございますか？**

   Have you received training on using technology for language teaching?

8. **本学は教員と学生への支援と研修などは充実していると思いますか？何かご意見やご提言がございますか？**

   Do you think the university offers enough support and training for teachers and students? Do you have any suggestions?

9. 学生が授業で電子デバイス(スマホ、パソコン、タブレット、スマートウォッチ、電子辞書等)の使用は禁止されますか？理由を教えてください。

   Do you ban technology use (smartphone, laptop, tablet, Smartwatch, electronic dictionary) in class? Why or why not?

10. もし指導や仕事上、困ったことがあれば、どういう風に対処しますか？

    When you have problems of teaching or doing your job, what will you do?

11. 学生たちは ICT を通じた学習(ICT の使用するスキル、授業中と授業外の意欲)について、どう思われますか？

    How do you perceive your students use technology for learning? (e.g. their digital skills, their motivation of using technology for in class and out of class learning)

12. 学生たちは Moodle を使っていると思われますか？

    Do you expect your students are using Moodle?

13. ICT(メール、SNS、Moodle、The existing LMS 等)を利用して、授業に何か影響を与えますか(仕事量、学生の反応、効果等)？

    Do you find any impacts of using technology (email, SNS, Moodle, The existing LMS etc.) for language instruction on your teaching (workload, students' reaction and outcomes etc.)?

Appendix K

Interview Questions for Students after One year of Moodle Implementation

【学生インタビュー問題②】

1. 〇〇先生の＊デジタルリテラシー、指導能力、言語知識はどう思いますか？

   How do you perceive XX teacher's digital literacy, teaching skills, and language

   proficiency?

   (＊デジタルリテラシー：インターネットを中心にデジタル情報や通信について、さらにはそれらを活用する

   パソコンやスマートホンなどの機器やアプリについて知識を持ち、利用する能力のことである。)

2. 協働/協調学習（友達、同級生と共同作業する中で、対話によって互いに理解を深め合う学習方法である。）について、どう思いますか？

   How do you perceive collaborative learning (e.g., learning with your peers, completing group activities)?

3. 学校教育経験と学校外の学習経験はどうですか？（例：学習の内容、交流、支援、学習環境、ニーズ、動機）

   How are your formal and informal learning experience? (e.g., content, interaction, support, environment, needs, motivation)

4. 中国語の授業で、何か変わってほしいところがあります？あったら何でしょうか？

   Do you think if there is anything should be changed in class? If so, what?

5. 電子機器（パソコン、スマホ、電子辞書等）を使ったら、授業中／授業外の勉強に集中できなくなることを賛成しますか？理由は？

   Do you think digital devices distract your learning in class and outside of class? Why or why not?

6. **Google** の検索や翻訳などの機能で、より容易に言語を学ぶことができることを考えていますか？ また、それがあれば、勉強しなくてもいいと思いますか？

   Do you think Google (e.g., search engine, Google translation) makes your language learning easier or changes your learning process?

7. 教員は **Moodle** で学生たちの活動記録が見られることを知っている？それに

ついてどう思いますか？

Do you know that the teachers can see your engagement in Moodle? How do you

feel about it?

8. **The existing LMS/Moodle** に関するご感想、ご意見は？（例：何か改善した方

が良いと思う？良い点、悪い点等）

What are your thoughts on The existing LMS/Moodle? (e.g., anything should be

improved, the good/bad things)