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From the guest editors

**New Waves in Technology-enhanced Development
for Chinese-language Teachers**

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There is no doubt that technology has changed how we think about education. However, despite mounting evidence about the numerous ways that technology facilitates Chinese-language learning (for a review, see Wu, 2016), comparatively little attention has been paid to the roles of technology in the education of Chinese-language teachers. Given that teachers are the major decision-makers regarding technology integration in language classes (Lin, Zhang, & Zheng, 2017), it is imperative that we gain a clearer understanding of issues related to their training. If teachers are insufficiently prepared for technology integration, it is unrealistic to expect that they will be able to capitalize on technology's demonstrated capacity to meaningfully engage learners.

The main goal for this special issue is to advance our understanding of technology in teacher education through an exploration of current trends and practices in the training of teachers of Chinese. It brings together articles that represent a wide variety of contexts, formats, and research methods – such variety being essential, as teaching and learning are both highly context-specific (Freeman & Johnson, 1998).

This issue features the following articles.

In *Technology and the education of Chinese-language teachers*, Lin, Liu, and Hu provide a qualitative synthesis of trends and gaps in the literature on technology and Chinese-language teachers' education. They categorize the reviewed literature into three main areas: 1) technology standards in Chinese-language teacher education, 2) the application of technology in such education, and 3) factors predicting technology adoption. The authors conclude with specific recommendations for researchers and practitioners in each area.

Examining pre-service Chinese teachers' multimedia design reports on Cheng's development and implementation of a program in Taiwan aimed at improving pre-service Chinese-language teachers' multimedia designs for online teaching. Her observations of

15 pre-service teachers revealed that they were able to incorporate various multimedia design principles into their online teaching, but that their implementation was inconsistent. This study highlights the importance of developing pre-service teachers' awareness of multimedia design for online teaching.

In *The development of skills required for online Chinese-language teaching*, Tseng details an intensive summer training program in the U.S. that aims at developing in-service Chinese-language teachers' online teaching skills. Based on observation of the program's online and face-to-face training components, Tseng found distinct improvements in the trainees' online teaching skills and in their pedagogical techniques.

In *Developing electronic teaching portfolios*, Chen documents six areas of improvement linked to the use of e-portfolios by 10 pre-service teachers in U.S. Based on the results, the author contends that using e-portfolios will help pre-service Chinese-language teachers advance academically and professionally, by facilitating regular reflection and teaching practice.

Like Tseng's paper (this issue), *Pre-service teacher training for online Chinese teaching* by Hsin, Hsieh, and Chang-Blust focuses on the development of pre-service Chinese-language teachers' online-teaching skills, but in a Taiwanese rather than a U.S. setting. Hsin et al. name their model CROPA, for courses, review, observation, practice, and adjustment – which between them cover all three of the components highlighted by Lin et al. (this issue). CROPA generated positive feedback from online students, and its creators offer recommendations about teaching via teleconferencing.

In short, the articles in this special issue of *Journal of Technology and Chinese Language Teaching* tend to reinforce the findings of the synthesis by Lin et al. (this issue) on the trends and research gaps in technology and Chinese-language teacher education. This issue also reminds us of the importance of both context and pedagogical knowledge when designing teacher-education programs. We should also be cautious about merely providing training in pedagogical and technological knowledge, however, for – as Liu, Lin, Zhang, and Zheng (2017) have noted – understanding language teachers' pedagogical beliefs is perhaps equally important. For those seeking to improve Chinese-language teachers' technology integration, modifying their pedagogical beliefs would be a logical first step.

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Technology and the Education of Chinese-language Teachers: Where Are We Now? (科技与中文教师教育之现况与发展)

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Abstract: Technology is exerting a profound influence on the development of Chinese-language skills and on the education of teachers of that language around the world. This qualitative synthesis of quantitative and qualitative research addressed trends and gaps in the literature related to technology and Chinese-language teacher education. The three main strands of research covered were 1) technology standards in Chinese-language teacher education, 2) the actual application of technology in such education, and 3) factors predicting Chinese-language teachers' technology adoption. Three major findings emerged. First, technology standards need to recognize an urgent need to agree upon and teach specific sets of skills, as theorized in frameworks such as Technological Pedagogical and Content Knowledge (TPACK). Second, while consistent improvements in Chinese-language teachers' technology knowledge and technological-pedagogical knowledge have been reported, three other key components – i.e., training, practice and reflection – need to be better integrated into their teacher-training models. Third, two external factors (resources and support) and three internal factors (pedagogical beliefs, technology knowledge and demographics) emerged as crucial to technology integration among these teachers. Based on these results, this review offers a series of recommendations to practitioners, policy-makers and teacher educators.

摘要: 教育技术对于对外汉语能力的发展与对外汉语教师教育, 有著重要的影响。此篇质性论文综述, 针对已发表的质化、量化研究, 指出科技与教师教育研究的发展与研究缺口。本文总结出三个研究方向: 1) 科技与对外汉语教师教育标准; 2) 科技与对外汉语教师教育; 3) 影响对外汉语教师使用科技的因素。三个主要发现为: 第一, 依据科技学科教学知识, 科技标准必须认识到科技知能是完全不同的能力。第二, 虽然教师的科技知识与科技学科在培训之后增长, 在训练过程, 三个重要环节: 培训、练习与反思, 必须更紧密地融入科技与对外汉语教师培训之中。第三, 两个外在因素(资源与支持) 和三个内在因素(教师信念、教师知识、教师个人背景) 会影响到对外汉语教师是否使

用教育科技于教学之中。依据这些发现，本文为对外汉语教师、教师教育与政策制定者提供了建议。

Keywords: technology standards, TPACK, teacher education, technology integration

关键词: 科技标准, 科技学科教学知识, 教师教育, 科技整合

1. Introduction

The use of information and communication technology (ICT) in language learning has been found to have a range of benefits (Chiu, 2013; Lin, 2015a, 2015b). ICT features such as time- and space-independent exchange, synchronous and asynchronous communication, text-based interaction, and many-to-many communication enable language learners to communicate with peers, instructors, and native speakers far beyond the limits of the classroom (Warschauer, 1997). Meta-analyses have shown that ICT demonstrates a moderate positive effect across many language skills (for a review, see Lin, 2015a).

A recent review by Wu (2016) of the literature on technology in Chinese-language education confirmed the benefits of ICT in the development of Chinese-language skills. Early forms of ICT such as online dictionaries and digital flashcards allowed Chinese students to improve the accuracy of their vocabulary knowledge, listening comprehension and pronunciation through computer-assisted repetitive practice. Subsequent advancements in ICT, such as virtual reality and social media, have provided learners with further agency to communicate and collaborate, and have facilitated project-and/or task-based language learning. Such advancements have thus motivated them to synthesize multiple language skills (i.e., reading, speaking, listening, writing) to reach their communicative goals in more authentic situations. The latest ICT developments such as mobile optical character recognition and automatic speech recognition are further directing the acquisition of various language skills into more discovery-oriented modes. In other words, ICT has shown considerable promise of “convenience, interactivity, consistency and effectiveness” in Chinese-language learning (Wu, 2016, p. 97).

Though the literature has highlighted many benefits of the use of ICT in language learning, little attention has been given to the role of ICT in language-teacher education, let alone in the context of teaching Chinese as a second language (L2). As Lin, Zhang, and Zheng (2017) recently noted, language teachers are pivotal players in the use of technology in language teaching. It is essential to understand how pre-service teachers are trained to use various technologies, and their attitudes toward using them in their classrooms. Without such knowledge, it is unrealistic to expect that L2 teachers can fulfil ICT’s potential to engage students in meaningful and interactive learning.

Accordingly, the purpose of this paper is to review three strands of research on Chinese-language-teacher education, namely: 1) its technology standards, 2) its actual use of technology, and 3) factors predicting Chinese-language teachers' technology adoption.

2. Technology Standards in Chinese-language-teacher Education

2.1 Teacher Preparation

With the aim of capitalizing on the benefits of technology in language education, U.S. education standards now frequently require pre-service teachers to be able to integrate technology into their teaching. Oxford and Jung (2007) reviewed five U.S. national guidelines for the integration of technology into the teaching English to speakers of other languages (TESOL), and found that all of them highlighted the importance of technology integration in teacher-education programs. Recently, the American Council on the Teaching of Foreign Languages (ACTFL) revised its program standards for preparing foreign-language teachers, to require teacher-education programs to offer pre-service teachers learning experiences in technology-enhanced learning environments, in the hope that this will increase their use of technology in their future teaching (ACTFL, 2013). In a recent review of technology standards for teacher-education programs in the U.S., Wang and Feng (2017) concluded that all such standards considered technology knowledge (TK) a necessary and integral component of pre-service teachers' knowledge. However, other types of teachers' knowledge including technological-pedagogical knowledge (TPK) and technological-pedagogical-content knowledge (TPACK; for definitions, see Mishra & Koehler, 2006) were not explicitly discussed. Wang and Feng also noted that these U.S. national standards were generic, i.e., that there was not yet any national standard tailored to a particular language.

Unlike the U.S., China has specific standards for Chinese-language teachers. The Office of Chinese Language Council, or *Hanban*, released *Standards for Teachers to Speakers of Other Languages* (国际汉语教师标准) in 2007 (see Zhang, 2009). These standards were then updated in 2012 and 2015, and published by the Foreign Language Teaching and Research Press (外语教学与研究出版社). As Wang and Feng (2017) noted, each successive iteration of these standards was frequently used in training and assessing pre-service teachers. Among the 10 standards enumerated by *Hanban*, the ninth concerns educational technology and its application in teaching. Specifically, it requires teachers to be familiar with the basic components and accessories of computers, to have basic levels of computer literacy, and to be able to use computers and online resources in teaching.

Nevertheless, such standards in China and in the U.S. remain brief (Wang & Feng, 2017). Based on a comparison of standards in these two nations, Wang and Feng (2017) suggested that, in China, TK was considered a part of teachers' pedagogical knowledge (PK) rather than as a stand-alone knowledge component.

2.2 In-service Teacher Development

The literature on technology standards for language teachers has focused overwhelmingly on teacher education, with little attention being paid to in-service teacher development. The Interstate New Teacher Assessment and Support Consortium (2013), a U.S. body “dedicated to the reform of the education, licensing, and on-going professional development of teachers” (National Research Council, 2001, p. 204), published *model core teaching standards* that did not include TK, though the term technology was used in many of their components (for a review, see Wang & Feng, 2017). This absence of TK ran counter to the recommendations of Mishra and Koehler (2006), whose theory of Technological Pedagogical Content Knowledge (TPACK) regarded technology as a tool to support instruction, assessment, reflective practice, and/or professional development. At the time of writing, technology standards for Chinese-language teachers in China also do not yet include standards for in-service teachers.

3. Technology in Chinese-language-teacher Education

This section focuses on training about and with technology for pre-service and in-service Chinese-language teachers. The first subsection will review research on training *with* technology, focusing on how ICT can be used to improve the effectiveness of Chinese-language teacher education. The second subsection then reviews studies related to teacher training *about* technology, with an emphasis on approaches that can facilitate Chinese-language teachers’ development of TK. The third subsection will summarize each of the five studied teacher- education models.

3.1 Training with Technology

Technology integration into teacher training has been a common form of pre-service training among Chinese-language teachers. Acknowledging the challenges that come with rapid technological advancement as well as the complex and context-bound nature of technology integration, a limited number of studies have sought to understand Chinese-language teachers’ development of technology-enhanced professional knowledge, and examined various training models (Cheng 2014). In such studies, the TPACK framework developed by Mishra and Koehler (2006), which emphasizes the connections and interplay among TK, PK, and content knowledge (CK), has played a central role.

To date, the few studies that have documented Chinese-language-teacher training with technology have covered video-conferencing tools (Cheng, 2014; Tseng, Lien, & Chen, 2016; Wang, Chen, & Levy, 2010a) and virtual reality (Cheng, Zhan, & Tsai, 2010).

3.1.1 Video-conferencing Tools

Several studies have examined the use of video conferencing in Chinese-language-teacher education. Wang, Chen, and Levy (2010b), for example, used the online synchronous video-conferencing tool Joinnet to train eight in-service Chinese-language teachers for 12 weeks in Australia. This was divided into four-weeks of online training, followed by an eight-week online teaching practicum. Wang et al. primarily focused on the stages that these teachers had gone through in developing their professional competence in teaching with technology. Through a survey, and collection of the participants' reflections and posts in online discussion forums, Wang et al. found that these teachers went through four stages: the "wow" stage, the "oh-oh" stage, the anxious stage, and the internalizing stage. Their first module was a face-to-face pre-training session, identified as the "wow" stage in which the teachers felt the training was both useful and easy. They were enthusiastic about online teaching, and exhibited little anxiety about the unknown, perhaps because they did not yet need to engage in any teaching preparation. This contrasted with the results reported by Cheng et al. (2010), whose pre-service participants were anxious from the beginning about using Second Life (see the next section for further details). The second stage that Wang et al. (2010b) identified, the "oh-oh" stage, arose when the training was offered online. Several technology issues arose, but the participating in-service Chinese teachers were not deterred by these challenges. Instead, they rapidly grasped the key differences between online and offline teaching, and soon adapted to the new online environment. The third or anxious stage started when they were asked to teach online for 15 minutes. Several participants reported feeling "inexperienced and incompetent" in online settings (p. 287), despite receiving very positive feedback from their peers. Wang et al. reported that through reflection, these teachers' apprehension and fear gradually faded. After spending at least three weeks actually teaching online, the participants entered the fourth or internalizing stage, in which what they had learned from the online training had been fully absorbed. All the participants showed improvements in their online-teaching skills and confidence, and ended the experiment with increased abilities to use technological tools in such teaching.

Similarly, Tseng, Lien, and Chen (2016) conducted a study that used web conferencing to develop in-service Chinese-language teachers' TPACK components. Based on the idea of group collaboration, Tseng et al. recruited four in-service teachers who were teaching online courses to American learners of Chinese. Each teacher had between two and four students in his or her online course. While the participants were teaching, they received the following four-stage training: 1) understanding TPACK, 2) observing and reflecting on peers' online instruction, 3) improving their own teaching by addressing problems identified in stage 2 by the other three teachers, and 4) reflecting on the revisions to their own teaching that were recommended in stage 3. This process was facilitated primarily by a teacher support group in which they sought to inspire each other and jointly examined various pedagogical approaches aimed at increasing student engagement. Based on data from online meetings, reflective reports, and individual interviews, Tseng et al. found that their teacher participants improved their TK and TPK, as evidenced by their use of multimodalities to present vocabulary concepts. Also, to

engage students and enhance linguistic production, it was found that the teachers began using multimedia as prompts.

Unlike Tseng et al. (2016) and Wang et al. (2010b), who used fully online training techniques, Cheng (2014) designed a 12-week blended training course to develop pre-service Chinese-language teachers' online teaching skills. Drawing on TPACK, Cheng employed content analysis of nine pre-service teachers' reflection journals to gain an understanding of the development of different types of knowledge. The results indicated that, among all components of teacher knowledge, PK increased the most; this was reflected in the pre-service teachers' increasing awareness of students' speaking opportunities, understandings of the significance of sufficient processing time, and adoption of more constructive strategies for asking questions. Ranked by degree of increase, PK was followed by TPK, i.e., teachers' adoption of multimedia, online resources and video-conferencing tools in their teaching; PCK, i.e., increasing importance attached to teacher feedback, student errors, and intercultural-communication activity design; TK, i.e., teachers' familiarity with available online tools and awareness of technology testing before class; and CK, i.e., teachers' awareness of regional linguistic differences, students' errors and intercultural-communication knowledge. However, the TPACK component technological content knowledge (TCK) was absent from the participants' reflection journals; Cheng attributed its absence to the curriculum and data source of the particular training program that she studied, and thus proposed that other research methods such as focus groups and surveys be used in future research.

3.1.2 Virtual Worlds

In addition to video conferencing, research on technology and Chinese-language teacher education has used virtual worlds to provide pre-service teachers with field experience. To enhance such teachers' learning experience, Cheng, Zhan, and Tsai (2010) designed a culture-enhanced Chinese region on Second Life: a massively multiplayer role-playing software launched by Linden Lab in 2003. Specifically, Cheng et al. designed a five-stage training model, including preparation, training, lesson planning, testing, and teaching. Their respondents, 65 pre-service teachers in Taiwan, were grouped into 13 groups, each of which was then paired with one Chinese-language learner in the United States. After two sessions, Cheng et al.'s survey revealed that the pre-service teachers had learned how to use Second Life effectively in their teaching. Though they encountered challenges relating to both pedagogy and technology, they gradually learned how to overcome them; and the authors concluded that after training, the pre-service teachers had favorable attitudes towards and increased confidence in using the virtual world in their Chinese-language teaching.

3.2 Training about Technology

As evidence mounts that pre-service teachers with higher levels of technology skills are more likely to use technology into their teaching (Koubek & Moeller, 2003), language educators have called for systematic and effective technology training to be

given to both pre-service teachers during their education and in-service teachers during their professional development (Fuchs & Akbar, 2013).

In an effort to understand the development of teacher trainees' technology-enhanced professional knowledge, Cheng (2017) further proposed and tested a Teaching-Learning version of TPACK known as TL-TPACK. Highlighting the importance of authentic instructional field practice in the pre-service training of Chinese-language teachers, TL-TPACK integrates five training strategies (practicum, course design, advisors, peer cooperation, and reflections) to ensure appropriate training and learning outcomes. Cheng's mixed-methods empirical study of pre-service Chinese-language teacher training using the TL-TPACK model used interviews with pre-service teachers and learners, content analysis of the trainees' reflections, and quantitative analysis of the trainees' and students' survey responses to review training outcomes and the pre-service teachers' TPACK competencies. Data analysis revealed that the pre-service teachers' technology-related knowledge, specifically TK, TCK and TPK, were enhanced by the TL-TPACK intervention. As such, this result answered Cheng's (2014) criticism that TCK tended to be ignored in such training. In addition, the pre-service teachers in Cheng's (2017) sample reported a belief that CK was gained through online field practice and enhanced through peer cooperation. The same study found that field practice, the use of intern advisors, and peer cooperation were all effective training strategies for the development of TK, PK and CK.

3.3 Training Models

Regardless of the medium (e.g., video-conferencing tools or Second Life), each teacher-education program developed by prior studies yielded some improvement in skills and knowledge among pre-service and/or in-service Chinese-language teachers. It should not be assumed, however, that such improvements are attributable to the mere use of technology in such settings. Rather, each component of such training programs – technological or otherwise – should be carefully examined as a possible contributor of their overall effectiveness.

Table 1, below, summarizes the training models developed by prior researchers on Chinese-language teacher education. Most include training, practice, and reflection among their major components. The first stage of such models normally comprises training, i.e., helping teachers to understand the whole process of the teacher-training program and providing them with the skills necessary to use the relevant technology – though there are wide variations in the terminology used, even by the same scholar. For example, Cheng (2014) used the term *teaching strategies* for this stage, while Cheng (2017) used *preparation stage*, with the former concept focusing on the development of pre-service PK, CK and TK, and the latter on acquiring skills for online teaching. Tseng et al. (2016) also called their first stage the *preparation stage*, even though it focused on TPACK and instructional strategies for using video-conferencing tools.

After an initial training stage, the second stage of such models is usually named the practice stage, and requires each trainee teacher to incorporate newly learned

knowledge and skills into their teaching. Cheng's (2010) second stage involved the writing of lesson plans, creation of testing materials, and actual teaching. Similarly, Wang et al. (2010a) designed a practice stage for in-service teachers in which they practiced teaching in a real online-teaching context (though in focusing on skill- and knowledge development alongside the practice of online teaching, Wang et al.'s model could be seen as a combination of the usual first and second stages). In the designs of their practice stages, several training models involved a collaboration component whereby in-service and pre-service teachers received feedback from their peers. As Wang, Chen, and Levy (2010a) noted, having such collaboration may facilitate the "personal and professional growth of the trainee teachers" (p. 779). Likewise, Cheng (2014) asked pre-service teachers to work collaboratively after completing their first-draft lesson plans, and to improve them based on peer feedback, and Tseng et al. (2016) asked in-service teachers to observe peer instruction and provide feedback on it.

Table 1 Summary of Training Models in Technology and Chinese Language Teaching

Study	Training model
Cheng (2010)	Preparation; training; lesson plan; testing; teaching
Cheng (2014)	Pedagogy training; teaching demonstration by master teachers; developing lesson plans; collaboration; feedback; reflection
Cheng (2017)	Preparation; practicum; reflection; evaluation
Tseng et al. (2016)	Comprehending TPACK; observing peer instruction; adjusting instruction; reflecting on enhanced teaching
Wang et al. (2010a)	Practice; reflection; collaboration

The third stage of such models usually involves asking in-service or pre-service Chinese-language teachers to reflect on the problems identified in previous stages and to adjust their teaching accordingly. Tseng et al. (2016) underscored the importance of reflection, a process that helps to link pedagogy to teaching with technology, and Cheng (2014) asked her participants to reflect based on TPACK. In addition to individual reflection, Wang et al. (2010a) asked their participants to share their reflections in an online discussion forum, and found that this activity helped to drive the participants' attention to a more theoretical level, and to consolidate the knowledge they had learned in prior stages of the model.

4. Factors Predicting Technology Adoption

Egbert, Paulus and Nakamichi's (2002) research on technological skills among pre-service language teachers found that they were not well-prepared to use technology in their future teaching. As compared to teachers of other subjects, language teachers have exhibited the least favorable attitudes toward using technology (Ravitz, Becker, & Wong, 2000), and their technology adoption has been documented as ineffective (Burston, 2014).

While many prior studies have explored facilitating factors for and barriers to technology use, only a few have focused on Chinese-language teachers. This section reviews the relevant studies in light of current scholarship on the factors influencing technology adoption among such teachers, which can usefully be divided into internal and external factors (for a review, see Liu, Lin, Zhang, & Zheng, 2017a; 2017b).

4.1 External Factors

External factors including time, access, administrative attitude, and resources have been discussed in the literature on barriers to teachers' use of technology (e.g., BECTA, 2004; Hew & Brush, 2007). Among such studies that focused on Chinese-language teachers, the two major external factors reported were resources and support.

4.1.1 Resources

Lack of resources has been called a major external barrier, not only to ICT-related practice but to achievement in general (BECTA, 2004). A recent study of 47 Chinese-language teachers in U.S. (Liu et al., 2017a) found that resource-related barriers still existed, with the participants highlighting the insufficient quantity online language-learning resources, difficulties in accessing the available technology, and devices not being set up properly for easy use.

4.1.2 Support

A lack of support has frequently been reported as an external barrier to technology integration, and may comprise deficiencies in funding, technical support and/or administrative support. Three studies of Chinese-language teachers identified problems related to support. Using a mixed methodology consisting of surveys and interviews, Lin, Huang and Chen (2014) found that external factors – including lack of support – were more significant barriers to such teachers' technology adoption than internal barriers were. Liu (2010) examined teachers' actual use of a specific technology – Second Life – instead of their general perceptions of technological adoption, and concluded that a lack of technical support was an external factor that prevented them from adopting it. Lastly, Liu et al. (2017a) reported that some of their participants found it troublesome to obtain help from the technicians in their schools, or that too few technicians were employed there.

Apart from these two major external factors, others such as insufficient time (Lin et al., 2014), pressure to meet high standards within a limited time (Liu et al., 2017a), or a lack of rubrics for evaluating learning outcomes (Liu et al., 2017a) have also been reported. Taken together, the results of the relevant prior literature indicate that external factors, considered as “first order barriers” (Ertmer, 1999, p. 48), still exist in Chinese-language classrooms.

4.2 Internal Factors

The importance of several internal barriers have also emerged from research on technology adoption among Chinese-language teachers. These include pedagogical beliefs, technology knowledge, and demographic factors.

4.2.1 Pedagogical Beliefs

Based on a comparison of expert and novice TESOL teachers' attitudes toward technology, Meskill, Mossop, DiAngelo, and Pasquale (2002) argued for the importance of aligning pedagogy with technology use. Research that focused specifically on Chinese-language teachers' technology adoption reported similar findings. Liu et al. (2017a), for example, reported that the set of negative attitudes originating from pre-service Chinese teachers' pedagogical beliefs was one of the two main internal barriers to such adoption in the United States (U.S.). Similarly, Li (2017) highlighted the importance of Chinese-language teachers' beliefs, and asserted that when they aligned their pedagogical beliefs with technology use, their instructional goals were more likely to be accomplished. Xie (2010) also contended that Chinese-language teachers needed to put more effort into choosing technological tools based on their pedagogical goals and teaching objectives.

In addition to the alignment of pedagogy with technology, the prior literature indicates that, if using a certain technology may cause problems, teachers' willingness to use it will decrease. Additionally, Liu (2010) reported that the possibility of inappropriate behaviors and comments in such open-ended learning environments as Second Life was also of major concern to teachers, especially at the K-12 levels.

Using technology effectively in teaching requires sufficient knowledge of the underlying psychological mechanisms of both learning and technology use. Wang (2006) examined the negotiation of meaning in a desktop video-conferencing environment, and found that – far more than in a face-to-face lecture – its one-to-one nature called for sustained concentration, careful planning, and awareness of and sensitivity to individual learners' needs.

4.2.2 Technology Knowledge

A lack of technology-related knowledge was one of the other main internal barriers identified in Liu et al. (2017a). Similarly, Lin (2010) indicated that a long learning curve may be the major obstacle to teachers adopting Second Life in their language classrooms. In their study of digital-technology use among nearly 200 K-16 Chinese-language teachers in the U.S., Ruan, Dai and Yeh (2014) noted the impacts of teachers' perceptions of technology use on their actual classroom use of it. Specifically, the authors noted a positive relationship between teachers' perceptions of digital technology and the number of technological tools they used in class, which in turn was correlated with their self-perceived abilities in technology integration and general computing.

4.2.3 Demographics

Several demographic factors have also been identified as potentially affecting Chinese-language teachers' use of technology. Lin et al. (2014), for example, reported that being under age 26, over age 30, and/or male could be a barrier to such teachers' technology use, with the age factor appearing to affect confidence in using ICT when preparing teaching material, and gender relating to whether teachers enjoyed spending time using ICT. Similarly, Ruan et al. (2014) found that Chinese-language teachers' ages and levels of teaching experience were negatively associated with their perceptions of technology use and their self-perceived abilities to use it effectively. This aligns with the findings of a study by Meskill et al. (2002), that compared expert and novice English teachers' attitudes toward the use of technology, and found that the more experienced teachers focused on learning processes and student empowerment, whereas the less experienced ones focused on learning products and student management.

5. Conclusion

This paper has reviewed the existing body of research on technology and Chinese language-teacher education, and identified its three main themes: 1) technology standards, 2) technology training for in-service and pre-service teachers, and 3) technology adoption. Regarding standards, the importance of technology in language-teacher education has been foregrounded in standards proposed in the U.S. and in China (Wang & Feng, 2017). Though these documents do not usually contain specific technology standards for pre-service language teachers' TK, it is clear that teachers are expected to use technology effectively for a variety of pedagogical purposes. Given the important role that these standards play in teacher education (Arnold & Ducate, 2015), it is important for them to reflect the fact that teaching languages with technology requires a specific set of skills, as theorized in TPACK and confirmed by multiple empirical studies (Comas-Quinn, 2011; Compton, 2009; Sun, 2014).

In terms of technology in Chinese-language teacher education, the literature can be further divided into three sub-themes: 1) training with technology, 2) training about technology, and 3) training models. Though each reviewed study had a unique training model and focus, they consistently reported improvements in Chinese-language teachers' TK and TPK. All the teacher-training models were also found to contain three similar core components, relating to training, practice, and reflection. Along with TPACK, these three components should be integrated into a Chinese-language teacher training model that is more clearly rooted in research on computer-assisted language learning (CALL) training, either in teacher education generally (Arnold & Ducate, 2015) or in Chinese-language teacher education specifically (see Cheng 2017). The review also revealed that informal training is an important under-researched area at the intersection of technology and Chinese-language teacher education, despite its demonstrated promise in facilitating skills development and knowledge acquisition (Arnold & Ducate, 2015).

The third theme that emerged from the present review regarded barriers to technology adoption. Based on the literature (see especially Liu et al. 2017a; 2017b), we classified such barriers into two main types: external factors (i.e., resources, support) and internal factors (i.e., pedagogical beliefs, technology knowledge, and demographics), and analyzed how each factor could affect teachers' decisions about technology adoption.

The three main identified themes imply that teacher development in CALL is multifaceted. Though this review has identified vital components of Chinese-language teacher training, we acknowledge that they are unlikely to be the best or only ways of training such teachers, as teacher development depends heavily on teachers' prior knowledge and training as well as their current contexts (Larsen-Freeman, 2012). In addition, it is important to stress that these three themes should not be taken in isolation from one another, as their interrelationship also plays an important role in teachers' ability to capitalize on the benefits that technology may bring to language learning. Therefore, a new, more transparent standard for Chinese-language teachers' TK is clearly needed if teacher educators are to align their teacher-training programs with the outcomes that the existing standards are aimed at supporting. In short, to facilitate teachers' development of knowledge and skills for technology integration, it is critical to understand their motivations and sources of resistance; to address those issues during the teacher-training process; and provide sustained support, even long after that process has ended.

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Examining Pre-service Chinese Teachers' Multimedia Design: A CTML-based Quantitative Study (以多媒體學習認知觀點檢視職前中文教師多媒體課程設計)

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Abstract: This quantitative study observed 15 pre-service Chinese-as-a-second-language (CSL) teachers' skills at integrating digital multimedia into their online instruction, through the lens of Mayer's (2014) cognitive theory of multimedia learning. Specifically, it examined their use of multimedia applications, their prior knowledge of design principles, and the consistency of their course designs by analyzing lesson plans, course materials, and clips of teaching video. Most of the participants were found to have integrated digital multimedia into their instruction, in keeping with the signal-, coherence-, and spatial-contiguity principles of multimedia design. However, inconsistency and incoherence in their designs still presented a major stumbling-block to effective learning. This study contributes to a deeper understanding of how Chinese pre-service teachers can integrate multimedia into instruction, and recommends that Mayer's multimedia design principles be incorporated into CSL pre-service teacher training.

摘要: 本研究以 Richard Mayer 的「多媒體學習認知」為理論基礎，檢測線上華語職前教師的多媒體輔助課堂的課件，探討其多媒體使用類型、多媒體教學設計之專業知能與穩定度。採量化研究，共分析 15 位遠距教師多媒體設計的課程教案、教材與教學影片。研究結果指出線上職前教師多數應用數位多媒體於課程設計，且教師的課件出現似強調原則、一致性原則、空間原則的設計現象。然而，這些課程設計現象並非穩定呈現，意味著教師的多媒體設計專業知能仍靠直覺並非專業多媒體設計知能的表現。此研究結果分析職前教師多媒體設計的現象，可作為培訓職前教師數位媒體設計之參考。

Keywords: Online instruction, Chinese as a Second Language teacher education, cognitive theory of multimedia learning, classroom-centered research

關鍵詞: 多媒體輔助語言教學、教學設計、線上教學、華語師資培訓、課堂研究

1. Introduction

Teacher educators' instructional instincts and aesthetic preferences vary significantly, and this may result in some ineffectively designed teaching materials (Kalyuga, Chandler, & Sweller, 1999). According to Mayer (2009), students can learn more deeply when their instruction includes multimedia approaches. Based on numerous empirical studies, Mayer (2014) developed the cognitive theory of multimedia learning (CTML), which aims to explain how students learn from words and pictures, as well as how to design multimedia learning materials that promote meaningful learning. CTML holds that both theoretical and practical perspectives on instructional design can be used as points of reference when designing multimedia-enhanced learning materials and as guidelines for assessing pre-service teachers' knowledge of how digital multimedia can and should be used in instruction.

Other studies have indicated that many teachers, including Chinese-as-a-second-language (CSL) teachers, do not use technology in instruction or remain skeptical about such use (Chen, 2014; Galanouli & McNair, 2001; Sessoms, 2008). However, online field practices that take into account the specific characteristics of the technology-based teaching environment can maximize teachers' application of their knowledge of digital multimedia (Cheng, 2016). Thus, to closely investigate teachers' performance in the sphere of multimedia-enhanced language instruction, the present study examined how Taiwanese preservice CSL teachers used digital multimedia in delivering their online language-learning content, in light of Mayer's (2014) guidelines. Its research questions were as follows:

- (1) What forms of multimedia do Taiwanese pre-service CSL teachers use in their online lessons?
- (2) What are these teachers' levels of professional knowledge of multimedia learning principles (i.e., multimedia-, coherence-, signal-, and spatial-contiguity principles)?
- (3) How consistently are these multimedia learning principles reflected in these teachers' online lessons?

2. Literature Review

This section focuses on CTML and its application to second/foreign language (S/FL) learning, with the aim of establishing assessment guidelines for pre-service online teachers' knowledge of multimedia learning principles.

2.1 Theoretical Framework

Many instructional multimedia materials are designed based on designers' or instructors' intuition and aesthetic considerations rather than on any particular theory or the results of systematic empirical study (Kalyuga, Chandler, & Sweller, 1999). CTML

aims to elucidate how people learn from words and pictures, and thus how best to design multimedia learning environments that promote meaningful learning (Mayer, 2014). Rooted in a learner-centered, constructivist approach, it proposes that multimedia promotes cognitive activity during learning via three assumptions: dual-channel, limited-capacity, and active processing. Dual-channel processing is derived from Paivio's dual-coding theory (1986); limited-capacity from Baddeley's theory of working memory (1998); and active processing from Sweller's cognitive-load theory (2005). In other words, CTML posits that humans process information actively, via separate information-processing channels for verbal information (whether written/printed or spoken) and visual information. Each channel has limited processing capacity, and only a portion of the information it carries is retained in one's working memory; and multimedia materials should be compatible with how people learn.

When incorporating multimedia into lessons, increasing learners' cognitive activity without overloading their working memory is challenging. According to Mayer (2014), learning is associated with three types of information processing: extraneous, essential, and generative processing. The first, extraneous processing, refers to cognitive processing that does not support the instructional goal and is caused by poor design. The second, essential processing, aims to mentally represent the presented materials in working memory, and is triggered by the complexity of the material. Lastly, generative processing aims to make sense of the presented materials, and is closely associated with the learner's motivation to learn. Depending on the relationships of learners to their instructional situations, the levels of these three types of processing differ considerably, but their sum cannot exceed an individual learner's cognitive capacity. For cases where the learner's cognitive capacity is overloaded and instructional designs are ineffective, Mayer (2014) proposed instructional techniques that would minimize extraneous processing, manage essential processing, and foster generative processing. The present study investigated the multimedia designs that would be required to support these three aims, in light of Mayer's seven principles of processing.

Table 1: Seven Principles of Extraneous and Essential Processing

Goal	Principle
minimize extraneous processing	coherence principle signal principle redundancy principle spatial-contiguity principle temporal-contiguity principle
manage essential processing	modality principle
foster generative processing	multimedia principle

As shown in Table 1, the first five of these seven principles – coherence, signaling, redundancy, spatial contiguity, and temporal contiguity – all relate to reduction of the extraneous processing caused by poorly designed materials that do not accomplish their instructional objectives and may increase cognitive load.

1. Coherence principle. People learn more effectively when seductive details are excluded from the learning content. Extraneous messages such as unrelated graphics, background music, and unnecessary text should be removed to help learners focus on the relevant information.
2. Signal principle. Effective learning is also facilitated when the organization of multimedia content is highlighted via attention-grabbing cues. Such cues can be text-based (e.g., using numbering or a red font), picture-based (e.g., arrows or changing colors), or a combination of the two (e.g., text and corresponding pictures that change into the same color). As such, this principle is closely connected to the spatial-contiguity principle, discussed further below.
3. Redundancy principle. The presentation of the same information concurrently in multiple forms does not enhance learning. For example, people learn more deeply from graphics combined with narration than from graphics, narration, and on-screen text (Mayer, 2014). Redundant multimedia often consist of the same words occurring in both printed and spoken form, e.g., an audio message with identical printed text, or a narrated animation with onscreen text. This tends to increase the cognitive load placed on learners' working memory, and thus should be avoided. However, the same study by Mayer also indicated that the negative effects of redundancy may be diminished or even eliminated when learners are more experienced or knowledgeable and when the text is presented short without graphics in the content
4. Spatial-contiguity principle. Mayer (2014) maintained that “[p]eople learn more deeply from a multimedia message when corresponding words and pictures are presented near rather than far from each other on the page or screen” (p. 279): e.g., text placed adjacent to the corresponding part of a diagram, and diagrams with numbered captions. The same research by Mayer reported that this principle is robust even among learners with low levels of prior knowledge, particularly when the learning materials are complicated and/or interactive.
5. Temporal-contiguity principle. Mayer (2014) held that “[p]eople learn more deeply from a multimedia message when corresponding animation and narration are presented simultaneously rather than successively” (p. 279). He added that these temporal-contiguity effects are especially marked among high-spatial learners when a presentation is system-controlled and the information it contains is long and complex.

Essential processing refers to the cognitive process evoked to mentally present the messages a person receives in their working memory, due to the complexity of the essential information these messages contain. The techniques suggested for managing essential processing can be summed up as the modality principle.

1. Modality principle. Learning efficiency is associated with visual and auditory modes. Mayer (2014) argued that a mixed-mode presentation of information (i.e., partly visual and partly auditory) is more effective than a signal-mode presentation (i.e., purely visual or purely auditory) of the same information.

Generative processing is a type of cognitive processing that endeavors to make sense of learning materials and is governed by individuals' learning motivation. It is similar to the germane cognitive load in cognitive load theory. In terms of instructional design technique, it is associated with the multimedia principle.

1. **Multimedia principle.** Mayer's (2005) multimedia principle holds that learning via words and pictures is more effective than learning with words alone. Verbal content can be printed, spoken, or audio-recorded. With advances in technology, visual learning content comprises a broad array of forms including illustrations, graphs, charts, photographs, diagrams, animations, videos, and three-dimensional graphics. Studies focusing on the multimedia principle (Mariano, 2014; Marković, Vukovac & Kliček, 2015; Fiorella & Mayer, 2016) have shown that presentations containing both verbal and visual content within a system, program, or learning materials tend to increase learner performance on retention and transfer tests. Mayer (2014) concluded that overall, the multimedia principle has weaker effects on retention than on transfer learning. However, the definition of this principle is relatively loose, and results may vary depending on the proximity and sequencing of the visual and verbal elements. In other words, instructional designers and instructors must consider the aforementioned temporal-contiguity and spatial-contiguity principles when applying multimedia content to their instruction, rather than relying on the multimedia principle in isolation.

2.2 CTML in S/FL Learning

In the specific context of language learning, Plass and Jones (2005) have indicated that multimedia-enhanced materials should be used to guide what students notice about words and images – a finding that clearly echoes the multimedia principle. Similarly, Koehler, Thompson, and Phye (2011) found that a multimedia system with features for accessing verbal and pictorial information affected learners with different knowledge levels differently, with the less-knowledgeable students benefiting the most from it. As noted above, the multimedia principle only provides a general concept of multimedia learning; yet, most studies have confirmed that the combination of text with images helps language learners learn vocabulary. Based on their empirical study of French S/FL learners, Jones and Plass (2002) concluded that individuals remember word translations more accurately when the materials incorporate both written and pictorial support rather than only one or the other. Similarly, Lin and Tseng (2012) showed that beginner-level learners of English as a second language (ESL) learned difficult words more effectively in an online multimedia reading passage with textual definitions videos than they did with either textual definitions and pictures, or textual definitions alone – indicating that dynamic graphics promote learning more than static graphics do. And Kuo et al. (2013) found that students using a multimedia-supported system learned English vocabulary more effectively than those who learned it in a traditional classroom.

Of Mayer's (2014) seven principles, redundancy has been focused on the most in the S/FL literature, and has yielded mixed results. On the one hand, Diao, Chandler, and Sweller (2007) found that beginners seemed to acquire less lexical knowledge when presented with both spoken and written text than when they were presented with written

text alone. The authors suggested that beginners' listening rates might be lower than their reading rates, and thus that simultaneous presentation of the textual and audio forms of the same material could have negative learning effects for them. Moussa-Inaty, Ayres, and Sweller (2012) obtained similar results: that when advanced English-as-a-foreign-language (EFL) learners learned the same materials from the reading-only group and reading-and-listening group, they performed better on a listening test in a reading-only condition than in a reading-and-listening condition. The two aforementioned studies imply that redundancy effects may hinder language learning.

On the other hand, some studies have indicated that redundant messages may help S/FL learning. Samur (2011) found that beginner-level learners of Turkish who received animation with concurrent narration and text presentation remembered more vocabulary than those who received animation with concurrent narration but no text – a result that is inconsistent with the redundancy principle. Samur suggested that when text has the function of translation, it can help beginner-level language learners to connect words to their meanings, and thus to remember more vocabulary. Mayer, Lee, and Peebles (2012) provided further support for the idea that redundant information may promote language learning. Working with a sample of college students who were learning academic content in their second language, the authors added redundant videos to an instructional audio podcast, and redundant captions to a video lecture. They found that adding redundant video elements to audio materials helped their participants to learn new knowledge in their second language, though adding on-screen subtitles to animated video did not promote learning. Mayer et al. proposed that their inconsistent results might be attributable to the peculiarities of learning *in* a second language rather than S/FL learning *per se*. However, the present author would argue that Mayer et al.'s participants could be classed as advanced second-language learners, and therefore as potentially using learning strategies similar to those of native speakers. However, more empirical studies are required.

Chinese-as-a-second/foreign-language (CS/FL) studies have also applied the signal principle to listening and grammar learning. Signal effects are added to focus learners' attention and can be incorporated into text, images, or both. An experimental study by Jone and Plass (2002) used both text and pictorial forms, and found that the comprehension of French learners with low prior knowledge of the language was improved when their listening materials provided pictorial and written annotation. Koehler et al. (2011) found that ESL students with low prior knowledge of English performed better on a passive-voice grammar test after using a multimedia instructional program, and ranked its highlighting and clickable annotations as highly helpful features. In short, signal effects appear to promote learning among beginner-level language learners.

Regarding the spatial-contiguity principle, Lee and Kalyuga (2011) investigated the effect of the layout of pinyin and Chinese characters on beginner-level Chinese learners' vocabulary learning. Crucially, they found that a vertical layout with characters on top/bottom and pinyin at the top/bottom could reduce split-attention effects, thus enhancing two-character (i.e. wèizhì (位置)) Chinese vocabulary learning.

The coherence principle has seldom been applied to research on S/FL learning. Gemino's (2005) study of a technology-mediated cooperative online system concluded that chat rooms with context-relevant graphics can have significantly positive effects on learners' knowledge application. However, this finding was not derived from language learners, and more empirical work will be needed to establish whether such technology's deployment in S/FL settings would yield similar positive effects.

In sum, the existing body of CTML-based research on S/FL learning is limited to vocabulary learning, and its findings mainly support just three of CTML's seven principles (i.e., the multimedia, signal, and spatial-contiguity principles). The redundancy principle has been applied in several studies, but their conclusions have been inconsistent, while the coherence, temporal-contiguity, and modality principles have been largely ignored by language-education researchers.

In part because of the S/FL literature's above-mentioned patchy coverage of CTML's key principles, many teachers may not be aware of these principles when designing their teaching materials (Kalyuga, Chandler, & Sweller, 1999). As such, it is essential to heighten pre-service teachers' awareness of CTML, especially in the context of designing multimedia learning materials.

3. Methods

The study used quantitative methods to analyze online lessons' slideshow presentations, animations and video clips created by 15 pre-service teachers in Taiwan. Only half of the participants used dynamic graphics, so CTML's modality, redundancy, and temporal-contiguity principle will not be discussed due to validity concerns.

3.1 Research Context

This study collected the instructional materials designed by 15 graduate student teachers (aged 23-28 years) in 2014 and 2015 as part of an online practicum course in a CS/FL teacher-training program in Taiwan. Through partnership with a private university in the United States, this course – titled Studies in Distance Learning for Chinese – incorporated four hours of online field practice in 2014, and five hours of such practice in 2015. The course's main instructional objectives were to develop pre-service teachers' knowledge of technology integration through five training strategies, *practicum*, *course design*, *advisors*, *peer cooperation*, and *reflections* (Cheng, 2016). Accordingly, the course content included technological resources associated with online education (e.g., online platforms, online resources) and pedagogical strategies associated with online language instruction (questioning, online activities, i+1, and spiral design) as well as the content that the pre-service teachers were expected to teach. Peers and course instructors reviewed the participants' materials before each online session. CTML was not specifically introduced in this course.

During the online lessons, as their outside class activities, American college students were allowed to practice their Chinese oral and listening skills and to learn new

vocabulary. The American students all had an intermediate level of Chinese knowledge, and were enrolled in a face-to-face Chinese class using Integrated Chinese Level 2 Part 1 as their textbook. Learning themes drawn from the American class included *introductions*, *campus life*, *hobbies and pastime*, *part-time job*, and *school system*. New vocabulary was provided by the Taiwanese online student teachers when it was pertinent to cross-cultural topics or otherwise meaningful for communication. To promote the American students' oral outputs, the pre-service teachers' questioning sometimes included specific vocabulary and grammatical structures that the former had already learned.

3.2 Participants

All of the pre-service teachers who enrolled in Studies in Distance Learning for Chinese in 2014 (n=11) and 2015 (n=4) were approached to participate in this study, and all agreed to do so. All the participants were female. Two of them did not provide any information about their teaching experiences (YUZ and LI). Prior to enrolling in this graduate course, seven of them (ME, MI, PI, YIN, MeN, XU, and HU) had some overseas Chinese-as-a-foreign-language (CFL) teaching experience. One (YA) did not have any experience of teaching Chinese, and six had little experience of it. Three of them had online tutoring experiences (QI, YIW, and MeN). None had taught CSL for more than two years.

Table 2: Participants' Backgrounds

ID	Year	Gender	CSL teaching experience
ME*	2014	F	One month: summer camp teacher in Taiwan Two weeks: Chinese teacher in Thailand Five months: Chinese intern teacher at a language center in Taiwan
MI*	2014	F	One year: Chinese instructor at a language center in Taiwan One year: Chinese instructor in Malawi
PE	2014	F	Three weeks: Chinese intern teacher at Beijing International School
PI*	2014	F	Two weeks: Chinese teacher in Thailand Two weeks: Chinese summer camp instructor in Taiwan
QI	2014	F	10 hours: online Chinese tutor
YA	2014	F	None
YIN*	2014	F	One month: summer camp language teacher One year: Chinese instructor at a language center in Taiwan Six months: Chinese instructor at Oak Hill School in the United States
YIS	2014	F	Nine hours: Chinese summer camp cultural instructor in Taiwan
YIW	2014	F	36 hours: Chinese instructor for young adults in Taiwan Three weeks: Chinese intern teacher at Beijing International School 10 hours: online Chinese tutor
YU	2014	F	Three weeks: Chinese intern teacher at Beijing International school One month: Chinese summer camp instructor in Taiwan
YUZ	2014	F	No information provided
LI	2015	F	No information provided
MeN*	2015	F	Two months: Chinese summer camp cultural instructor in Taiwan

			One month: online tutor, Princess Sumaya University for Technology, Jordan
			One month: intern teacher, Pretoria Chinese School, South Africa
			One year: TA, Huish Episcopi Academy, England
			One month: TA, The Howard County Public School, USA
XU*	2015	F	One year: Chinese teacher in Taiwan
			One year: Chinese teacher in Japan
HU*	2015	F	Two weeks: Chinese intern teacher at Beijing International School
			One year: Chinese TA in a high school in Korea

* Indicates a pre-service teacher with overseas Chinese-teaching experience.

3.3 Procedures

Data were collected according to the following procedures. First, at the beginning of each semester, the researcher distributed an online questionnaire regarding the participants' demographic information and professional experience. Consent forms were also collected. As shown in Table 3, each participant in 2014 taught five hours of online lessons, and each participant in 2015, four hours. All of this instructional material, a total of 71 hours, was collected, and one hour of material designed by each of the 15 participants was selected randomly for analysis. The final sample of material included four hours from session 1 (ME, YA, YUZ, and HU), three hours from session 2 (MI, YIN, and LI), three hours from session 3 (PE, YIS, and MeN), three hours from session 4 (PI, YIW, XU), and two hours from session 5 (QI and YU). Slideshows, videos, audio, and screen-capture videos of their online lessons comprised the majority of the data analyzed in this study.

Table 3: Data Collection

ID	Year	Practicum hours	Selected materials
ME*	2014	5	Session 1
MI*	2014	5	Session 2
PE	2014	5	Session 3
PI*	2014	5	Session 4
QI	2014	5	Session 5
YA	2014	5	Session 1
YIN*	2014	5	Session 2
YIS	2014	5	Session 3
YIW	2014	5	Session 4
YU	2014	5	Session 5
YUZ	2014	5	Session 1
LI	2015	4	Session 2
MeN	2015	4	Session 3
XU	2015	4	Session 4
HU	2015	4	Session 1
Total		71	

3.4 Data Analysis

Although 71 hours of materials were obtained, technical issues caused some of the participants' video clips to go missing, while some pre-service teachers shared one student, so those teachers had fewer practicum hours. It was for these reasons that the researcher decided to randomly code one session from each teacher, with the aim of

observing an equal amount of data from all the participants. As a result, 15 hours of material were used for further analysis, and identified according to both the participant who created it, coded in letters, and the number of the session it was created for, coded as a numeral: i.e. ME1, MI2, PE3, PI4, QI5, YA1, YIN2, YIS3, YIW1, YU2, YUZ4, LI2, MeN3, XU4, and HU1 (Table 5).

Then, the researcher calculated the number of dynamic graphics and presentation slides that incorporated both static graphics and text, to establish the pre-service teachers' usage of multimedia. Next, to test the operation of the signal principle, the researcher calculated the number of the presentation slides that used signal cues; for the coherence principle, the number of presentation slides containing seductive details; and for the spatial principle, the number of slides containing layouts of (1) Chinese characters, vocabulary, and sentences and pinyin and (2) graphics and text. Finally, the participants' levels of consistency for each design principle were calculated as percentages.

4. Results

The current study first observed the verbal and pictorial messages placed in their instructional materials by pre-service teachers, and then analyzed these designs in light of CTML.

4.1 Research Question 1: Forms of Multimedia that Pre-service Teachers Use

The pre-service CSL teachers recruited for this study tended to use both words and graphics in their slideshow presentations. On average, as shown in Table 4, approximately 77% of the online materials they created contained both graphics and words. Nine of the participants' materials used this combination in 80% of their total number of presentation slides, while only four used it in 60% of their slides or less.

Table 4: Pre-service Teachers' Lessons That Used Both Words and Pictures

ID	MI2	YIS3	PE3	QI5	PI4	YIW1	YU2	HU1	MeN3	LI2	ME1	XU4	YIN2	YA1	YUZ4	average
%	100%	94%	92%	91%	90%	86%	86%	83%	80%	73%	62%	60%	59%	51%	45%	77%

Nine participants also included animations and/or video clips in their online lessons, and all such material was analyzed. Among these nine teachers, three (EM, YA, and LI) used existing YouTube videos, two (MI and YIN) used self-created videos, and four (PE, PI, YIS, and MeN) used online animations created by themselves through an online animation app that had been introduced to them as part of their curriculum (Table 5). The self-created videos were mostly used for introducing campus life, while animations were employed for listening exercises, and YouTube videos for both of the above purposes plus the presentation of Chinese songs.

Table 5: Pre-service Teachers' Dynamic Graphics Usage

ID	animations	videos	Notes
ME1*	0	1	YouTube videos for songs
MI2*	0	2	Self-created videos for campus life, and YouTube videos for listening practice

PE3*	1	0	Animations for listening practice
PI4*	1	0	Animations for listening practice
QI5	0	0	
YA1*	0	1	YouTube videos for songs
YIN2*	0	1	Self-created videos for campus life
YIS3	1	0	Animations for listening practice
YIW1	0	0	
YU2	0	0	
YUZ4	0	0	
LI2*	0	1	YouTube videos for campus life
MeN3*	1	0	Animations for listening practice
XU4	0	0	
HU1	0	0	
Total	4	6	

* Indicates a participant who used dynamic graphics.

Given that more than half of the participants applied dynamic graphics and three-quarters a combination of static graphics with text, it would appear that – consciously or unconsciously – most of these pre-service teachers were aware of the multimedia principle. This is perhaps not unexpected, as all were in their 20s and had extensive experience of using technology in their personal lives. However, as Mayer (2014) has indicated, simply using combinations of pictures and text in the design of instructional material does not guarantee learning effectiveness, and proper use of multimedia requires that one understands both the theoretical and the practical underpinnings of one's lessons. Accordingly, the current study further investigated the participants' online lesson designs based on the signal, coherence, and spatial-contiguity principles, to assess their levels of professional knowledge of multimedia principles and whether they applied such knowledge consistently.

4.2 Research Questions 2 and 3: The Participants' Levels and Consistency of Professional Knowledge of Multimedia Learning Principles

4.2.1 The Signal Principle

Because the foci of the participants' course and the classes they taught were spoken-Chinese skills and cultural- or theme-based vocabulary learning, this study did not focus on the use of text or graphics in reading or writing exercises. Thus, the investigation of signal messages in the participants' online lessons focused on their presentations aimed at vocabulary learning. Data analysis revealed that the pre-service teachers' signal cues were of three general types: text-based, symbol-based, and both. Only two participants (ME and MI), both from the 2014 group, did not use any signal effects in their online lessons.

As shown in Table 6, the pre-service teachers in this study used three strategies for their text-based designs: font coloring, frame coloring, and both. Figure 1 presents examples from the preservice teachers' online lessons. Frame coloring was the most favored strategy when presenting new vocabulary (n=11, 73%), while the font-and-frame strategy was the least used (n=2, 13%). Font coloring was used by nearly half the participants (47%).

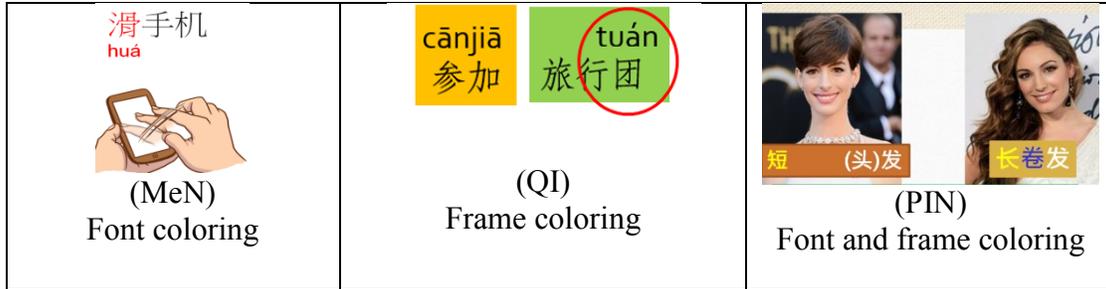


Figure 1: The Participants' Three Strategies for Text-based and Symbol-based Design

The symbol-based strategy can be further categorized into approaches that use true symbols and those that use shapes (Figure 2). As Table 6 indicates, slightly more than half of the participants (n=8) preferred true symbol and shape strategies (n=8, 53%). Overall, 87% of the pre-service teachers (n=13) applied signal strategies to enhance vocabulary learning.



Figure 2: The Participants' Strategies for Symbol-based Design

Table 6: Signal Principle Presentation Types

Types	Designs	Total number	%	ID
text-based	font coloring	7	47	PE3, PI4, YA1, YIN2, YUE2, LI2, MeN3
	frame coloring	11	73	PI4, QI5, YIN2, YIS3, YIW1, YUE2, YUZ4, LI2, MeN3, XU4, HU1
	font and frame coloring	2	13	PIN4, YIN2
symbol-based	symbol	8	53	PE3, PI4, YIN2, YIW1, YUE2, LI2, MeN3, HU1
	shape	8	53	PE3, PI4, QI5, YIN2, YIS3, YUE2, LI2, XU4

In terms of consistency, most of the pre-service teachers used some cues in their materials, but they did not present their signals consistently. As Table 7 shows, only one online lesson (by MeN) that applied signal effects for vocabulary learning could be characterized as having consistent designs, while 12 (80%) were inconsistent, and the other two did not use any signal cues. This finding suggests that, while most of these pre-service teachers did not possess knowledge of the signal principle, they nevertheless used cues of some kind to present new vocabulary. However, due to their lack of theoretical grounding, those cues were essentially meaningless. As this technique is strongly associated with Chinese vocabulary learning, teacher educators should introduce the signal principle to the pre-service teachers to help them stabilize their designs.

Table 7: Pre-service Teachers' Use of the Signal Principle

ID	Number of consistent designs	Number of vocabulary-learning slides using the signal principle	% of consistent designs
MeN3	5	5	100%
QI5	4	6	67%
PE3	6	11	55%
YUE2	6	11	55%
YIS3	4	8	50%
XU4	3	7	43%
YIN2	3	8	38%
PIN4	3	9	33%
YUZ4	1	3	33%
HU1	2	9	22%
YIW1	1	5	20%
YA1	0	1	0%
LI2	0	9	0%
Average			40%

4.2.2 The Coherence Principle

As previously discussed, the coherence principle revolves around the presence and absence of seductive details in learning content. For purposes of the current study, the term seductive details refers to graphics and words unrelated to the learning theme: e.g., the princess and associated text in the left-hand panel of Figure 3, which are unrelated to the theme “making online friends”, and the cupcake in the right-hand panel of the same figure, which is unrelated to the learning theme “boy/girl friend”. Rather than promoting learning, such seductive details may even hinder it by distracting learners’ attention. Further investigation of the consistency of the pre-service teachers’ lessons vis-a-vis the coherence principle was necessary to determine whether they possessed knowledge of that principle.



Figure 3: Examples of Seductive Details (Coherence Principle)

Table 8 shows that the number of multimedia slides produced by individual participants ranged from a low of seven to a high of 49. Two pre-service teachers (YA and LI), who did not use any animation effects in their designs, used the most slides: 48 and 49, respectively. Those who took advantage of the animation and placed many graphics and words in each slide (e.g., YIW) created much smaller numbers of slides.

Regarding seductive details in those slides, on average, 16% of the sampled online lessons contained seductive details, and only three of the participants' materials (PI, YUZ, and XU) did not contain any seductive details. At one extreme, the materials created by PE and YIS contained 54% and 33% irrelevant graphics and text, respectively. Two-thirds of the participants' lessons contained between 9% and 27% seductive details. These findings imply that 80% of these preservice teachers (n=12) were unaware of the negative learning impact of irrelevant graphics and text, i.e., that they lacked knowledge of the coherence principle.

Table 8: Pre-service Teachers' Use of the Coherence Principle

ID	seductive details	total number of multimedia presentation slides	%
PE3	7	13	54%
YIS3	6	18	33%
MI2	4	15	27%
ME1	6	29	21%
LI2	9	48*	19%
QI5	2	11	18%
YA1	7	49*	14%
YIW1	1	7**	14%
YIN2	3	22	14%
YU2	3	22	14%
MeN3	2	20	10%
HU1	2	23	9%
PI4	0	10	0%
YUZ4	0	11	0%
XU4	0	20	0%
Average			16%

* Indicates a participant who used high number of slides

** Indicates a participant who used lowest number of slides

4.2.3 The Spatial Principle

Based on Lee and Kalyuga's (2011) previously cited findings on the effects of layout, and on Mayer's (2014) definition, the spatial contiguity of the participants' designs can be categorized into two types: text only, and graphics and text. The first refers to the vertical or horizontal presentation of pinyin and Chinese characters, vocabulary, or sentences, as shown in Table 9. The latter refers to related graphics and texts that are presented in close proximity.

Table 9: Examples of Spatial Contiguity

Text	Examples	Descriptions
Characters	 <p>(HU1)</p>	Vertical presentation of Chinese characters and pinyin

		Horizontal presentation of Chinese characters and pinyin
Vocabulary		Vertical presentation of Chinese two-word vocabulary and pinyin
		Horizontal presentation of Chinese two-word vocabulary and pinyin
Sentences		Vertical presentation of Chinese sentences and pinyin

As shown in Tables 9 and 10, the participants applied five types of text-only layouts. Each pre-service teacher applied at least one type of spatial-contiguity strategy to her lesson. Nearly all (93%, N=14) of the participants presented Chinese vocabulary and pinyin vertically when teaching vocabulary, and 40% (N=6) presented Chinese vocabulary and pinyin horizontally. Few participants (N=5) applied a spatial-contiguity strategy to the presentation of Chinese characters (N=3) and sentences (N=2), possibly because the instructional objectives focused on listening and speaking. As a general matter, when the text versions of teachers' questions are presented simultaneously to the teachers' spoken output, it is difficult to determine whether learners' comprehension of the questions is attributable to their listening or reading skills; and this assessment-related difficulty could explain why relatively few examples of presenting Chinese sentences and pinyin were observed in this study.

As indicated in Table 10, all of the pre-service teachers' lessons contained examples of words presented near the corresponding graphics.

Table 10: Spatial-Contiguity Principle Presentation Types

types	designs	number of teachers	%	ID
text only	Vertically presentation, Chinese characters and pinyin	1	7%	HU1
	Horizontal presentation, Chinese characters and pinyin	2	13%	PE3, YUE2
	Vertical presentation, Chinese two-word vocabulary and pinyin	14	93%	ME1, PE3*, PIN4, QI5, YA1, YIN2, YIS3, YIW1, YUE2*, YUZ4, LI2, MeN3, XU4, HU1
	Horizontal presentation, Chinese two-word vocabulary and pinyin	6	40%	MI2, PE3*, YIN2*, YIS3*, YUE2*, HU1*
	Vertically presentation, Chinese sentences and pinyin	2	13%	YIN2, LI2
graphics and text	Words and graphics presented in close proximity	15	100%	ME1, MIN2, PE3, PIN4, QI5, YA1, YIN2, YIS3, YIW1, YUE2, YUZ4, LI2, MeN3, XU4, HU1

* Indicates a participant who used both horizontal and vertical design.

Table 10 also reveals that five participants (PE, YIN2, YIS3, YUE2, HU1) presented Chinese two-word vocabulary and pinyin inconsistently, i.e., both horizontally and vertically. As shown in Table 11, however, approximately 89% of the pre-service teachers' lessons consistently presented graphics and related text in close proximity to each other. All the lessons created by six of the pre-service teachers (PIN, QI, YUZ, LI, MeN, XU) followed the spatial-contiguity principle. One participant (PE) did not show any consistency, while four others (YIN, YIS, YUE, HU) did not present coherent layouts for their Chinese vocabulary and pinyin, and also produced weak designs in terms of text/graphics proximity. Overall, regarding the spatial-contiguity principle, five of the 15 preservice teachers (33%) appeared to lack knowledge of the spatial-contiguity principle for integrating multimedia into their instruction.

Table 11: Presentation of the Spatial-Contiguity Principle

ID	Text and corresponding graphics presented in close proximity	Total number of slides including graphics and corresponding text	%
PIN4	9	9	100%
QI5	7	7	100%
YUZ4	3	3	100%
LI2	25	25	100%
MeN3	13	13	100%
XU4	5	5	100%
YA1	18	19	95%
MI2	11	12	92%
ME1	15	17	88%
HU1	12	14	86%
YIS3	13	16	81%
YUE2	13	16	81%
YIW1	4	5	80%
YIN2	10	14	71%
PE3	7	12	58%
Average			89%

To sum up, the pre-service teachers in this study used both static and dynamic graphics and words, and approximately 60% of them applied dynamic graphics for online spoken-Chinese lessons. Dynamic graphics including YouTube videos, self-created videos, and animations were all applied to serve clear instructional purposes.

As a group, the participants possessed considerable knowledge of multimedia principles, but exhibited wide variation in their understanding of the concepts of the signal, coherence, and spatial-contiguity principles. For example, approximately 87% (n=13) understood the signal principle, but 80% (n=12) did not produce consistent designs.

Moreover, the materials produced by just 20% (n=3) of these pre-service teachers reflected the coherence principle, while among the lessons created by the remainder of the sample (80%, n=12), 16% contained seductive details. In other words, despite 80% of the participants not possessing knowledge of the principle, seductive-message effects remained relatively rare in their work.

All 15 participants applied at least one type of spatial-contiguity strategy to their lessons, though 33% (N=5) did not do so consistently.

5. Conclusion

The participants in this study, all of whom were under age 30, mostly applied combinations of graphics and text to their instructional designs. These results reflect that most young pre-service CSL teachers possess technology-related knowledge, and are adept at finding graphics, typing Chinese characters, editing videos, and searching for online videos suitable to Chinese online instruction. Such knowledge should be treated as fundamental for online teachers, as also recommended by Cheng (2016), who found that teaching online lessons drew heavily upon pre-service teachers' knowledge of technology integration. However, the fact that it is not especially difficult for young teachers to apply multimedia to their instruction can mask that they may or may not be doing so in accordance either with multimedia theory or with how people learn in real-world situations.

The findings of this study have important implications for CS/FL teacher training. Variations in individuals' instructional instincts mean that some CTML principles are applied consistently and others are not. Thus, Chinese teacher-educators should discuss Mayer's (2014) multimedia principles in detail, and actively redress gaps in their students' knowledge of these principles to reinforce their professional skills.

The main findings of this study are as follows. First, most of the pre-service teachers applied some type of signal message in their lessons, but the majority who did so were inconsistent in how these signals were presented, and thus appear to have lacked deep knowledge of the signal principle. The purpose of such signals is to catch learners' attention, and only a consistent presentation can serve this purpose effectively over time, since cues as color, framing, and font style become meaningful to learning. Making learning meaningful is also the primary goal of CTML (Mayer, 2014).

Second, although seductive details were observed in less than one-fifth of lessons from twelve pre-service teachers, many of the participants were found to be unaware of the coherence principle. Pre-service teachers should not only be aware of their use of graphics as content, but also the overall graphic design of their presentations. In presentation slides, simple outlining and solid colors are recommended for background designs in preference to photos and complex graphics. Lastly, it seems that all of the pre-service teachers understood the spatial-contiguity principle, but 33% of them nevertheless applied it inconsistently.

In terms of instructional implications, this study's findings regarding the signal principle could be applied to Chinese vocabulary teaching through consistent use of colors or framing to differentiate the functions of vocabulary: e.g., red for verbs and black for nouns. Likewise, in keeping with the present study's findings and those of Lee and Kalyuga (2011), the spatial-contiguity principle can be upheld via the consistent vertical presentation of two-word vocabulary and pinyin, which minimizes the split-

attention effect and thus may help learners to quickly identify the correct pronunciations of characters. The present study's results also confirmed that pre-service teachers are likely to design online course materials with irrelevant graphics or text; because such elements may distract students' attention, teacher-educators should devote more time to helping their students avoid it. Perhaps most importantly, in the case of speaking-and-listening lessons, it is critical that graphics and text work together and in keeping with CTML's signal, spatial, and coherence principles. It is therefore recommended that teacher-training courses on multimedia integration should make CTML central to their efforts to promote pre-service teachers' professional and skills.

This study has some limitations. First, data on the content of dynamic graphics were not analyzed because of the smallness of the sample, and this meant that a full examination of the respondents' work in CTML terms – i.e., including the modality, redundancy, and temporal-contiguity principles – was not possible. Second, the study's findings are associated with online lessons designed in Asia for speaking and listening practice in an Asian language; thus, its conclusions might not be generalizable to online lessons in reading and writing; to face-to-face educational settings; or to other cultural/linguistic settings. Accordingly, future research should gather data on dynamic graphics and use it to investigate the modality, redundancy, and temporal-contiguity principles, as well as data from lessons with different learning themes or instructional objectives such as reading or writing, and data from additional countries. Finally, a larger and more diverse future sample should also include in-service teachers.

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The Development of Skills Required for Online Chinese Language Teaching (网上中文教师教学技能培养之探讨研究)

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Abstract: This paper describes and analyzes an intensive summer training program for development of skills required for effective online teaching in Mandarin Chinese. The program pioneered a blended training model featuring two weeks of online training followed by three weeks of onsite training in the United States. During the program, twelve in-service teachers received intensive training on effective pedagogy and technology use, followed by a supervised practicum of teaching online synchronous sessions. The study employed a combination of quantitative and qualitative analyses to document teachers' growth and development of required skills. Quantitative analysis, based on the results of a self-assessment checklist that teachers completed before and after the program, is the core of the assessment. Qualitative data, based on teachers' self-reflections that were partial requirements of their e-portfolios, supplements quantitative analysis. The results indicate substantial evidence of acquired skills in pedagogy and technology through the blended training model for online teaching. Directions for future research are recommended at the end of the paper.

摘要:此研究探讨网上中文教师在暑期密集培训项目中有效教学技能的培养。此培训项目采混合式培训模式，包括两周网上培训与三周面对面的网上试教现场指导，课程结合有效教学方法与电脑科技辅助工具之理论与实践两部分，参加培训的全部十二位中文教师皆顺利完成五周密集培训课程。此研究针对网上教学必备技能与教师专业能力的培养进行质与量的分析，以量的分析为主，质的分析为辅。在量化研究方面，针对项目开始前与结束后教师自我检测结果进行描述性统计；在质化辅助分析方面，根据教师于项目结束时，汇整完成的网上教学专业档案中的自我反思部分，针对量化分析紧密相连的部分进行归类分析描述。研究结果显示，教师透过此混合式的密集培训，于项目结束时在教学技能与电脑辅助工具的运用能力两方面有明显的提高。本文最后指出未来研究方向。

Keywords: teacher development, teaching skills for online Chinese language teaching, blended training model, STARTALK, self-reflections, quantitative and qualitative analysis

关键词: 教师培训, 网上中文教学技能, 混合式师资培训模式, 星谈计划, 教师自我反思, 质与量的分析

1. Introduction

As the Internet and online technologies grow ever more advanced and ubiquitous, online language learning grows just as rapidly. The popularity of online language courses has increased continuously over almost two decades, the latter of which saw a spike of research-based publications attempting to define the "best practices" of online language teaching (Berber-McNeill, 2015). Indeed, White (2003) reported more than 1,300 online distance language courses out of the 55,000 distance language courses registered in 130 countries. Queen and Lewis (2011) pointed out that more than 1.8 million students enrolled in K–12 distance learning courses in the United States, a number more than triple the 506,950 students in 2004–05 (Zandberg and Lewis, 2008). Watson, Pape, Murin, Gemin, and Vashaw (2015) analyzed different sources of data and estimated that in 2014–15, 2.2 million students were taking online courses. However, because online learning is "a relatively new phenomenon beyond the direct experience of many policy makers and parents" (Wicks, 2010), misconceptions related to professional development of online teachers abound. The assumption that teachers who are good at face-to-face teaching can transition flawlessly to online teaching is not uncommon. Davis and Rose (2007) identify three myths regarding online teacher qualification:

- Any regular classroom teacher is already qualified to teach online.
- Any highly qualified face-to-face classroom teacher is ready to teach a quality online course that has been previously prepared or purchased. Some say those who teach a section that is already online don't really teach at all!
- Newly qualified teachers who learn about virtual schooling in their preservice programs will be ready to teach online when they graduate.

Hubbard (2008) describes online language teachers as "pivotal players ... as they select the tools to support their teaching and determine what CALL (computer assisted language learning) applications language learners are exposed to and how learners use them," but demonstrates that although technology education is necessary for these qualifications, training programs specifically for language teachers is lacking. In addition, the technology used in online language teaching changes at least annually; while certain advances involve only the transfer of an existing pedagogical methodology to a new medium, others imply new methodologies that require more extensive training (Jones and Youngs, 2006).

2. Required Skills for Online Language Teaching

Although technologies for online teaching have been the subjects of much research, the training of online teachers has been neglected (Hampel and Stickler, 2005). Easton (2003) states that online teaching requires a paradigm shift regarding instructional time and space, virtual management techniques, and the ability to engage students through virtual communication, yet very few formal language teacher preparation program graduates feel equipped with the skills that enable them to dive into online teaching by the time they graduate (Kessler, 2006). Hampel and Stickler (2005) argue that teaching language online calls for unique skills that differ both from traditional face-to-face language teaching and from teaching other subjects online. However, although it is clear that online language teaching requires and prompts a set of unique skills, most instructional technology preparation in teacher training programs focuses on digital literacy or software-specific orientation (Kessler, 2006) rather than pedagogical techniques geared toward these new media. It has been indicated that the greatest shortcoming of technology-enhanced instruction is the lack of adequate teacher training for such use (Butler-Pascoe, 1995; Egbert and Thomas, 2001).

In an effort to provide guidelines for online tutor training, Bennett and Marsh (2002) identify three goals: a) demonstrate sufficient technical skills to tutor effectively using the online learning environment; b) identify the significant differences and similarities between face-to-face and online learning and teaching contexts; and c) identify strategies and techniques to facilitate online learning and help students exploit the advantages in relation to both independent and collaborative learning. Researchers have categorized three key areas of professional development for pre-service online teachers: socialization, active participation, and collaboration (e.g., Kelly and Jones 2003). Jones and Youngs (2006) argue that a novel aspect of online instruction is the combination of pedagogical goals with a course's technological underpinnings, and that "creating socialization is an important skill for teachers to learn in the online arena" (p. 267).

Hubbard and Levy (2006) recognize that both technical and pedagogical knowledge and skills are crucial for computer-assisted language learning (CALL): technical knowledge and skills are necessary for the competent operation of the computer technology, and pedagogical knowledge and skills prompt a teacher to consider the computer technology's impact on a learning environment in order to integrate it into the teaching and learning process appropriately and effectively. The following figure lays out details on the matrix.

	Technical	Pedagogical
CALL Knowledge	Systematic and incidental understanding of the computer system, including peripheral devices, in terms of hardware, software, and networking.	Systematic and incidental understanding of effective computer use in language teaching.

CALL Skill	Ability to use technical knowledge and experience both for the operation of the computer system and relevant applications and in dealing with various problems.	Ability to use knowledge and experience to determine effective materials, content, and tasks, and to monitor and assess results appropriately.
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Figure 1: Technical and pedagogical knowledge and skills for CALL

Social construction has been the focus of multiple studies on online language learning. The internet is uniquely equipped to connect people across distances, as recognized in Felix (2002). Kern et al. (2004) argue that using the internet as a new medium for language learning does not necessarily require teachers to "teach the same thing in a different way, but rather to help students enter into a new realm of collaboration inquiry and construction of knowledge, viewing their expanding repertoire of identities and communication strategies as resources in the process." More specifically, online language teaching calls for a pedagogical shift away from teacher-centered approaches and instead toward a personalized, small-group oriented, multidimensional model (Sun, 2011). It is vital for online teachers to create a collaborative environment for long-distance learners.

In *New Skills for New Classroom: Training Tutors to Teach Languages Online* (2005), Hampel and Stickler propose a skill pyramid that visualizes a hierarchy of key competencies of an online language tutor. The pyramid has seven levels that range from lower-level skills such as basic ICT competence to higher-level skills such as creativity and choice (depicted in the following figure).

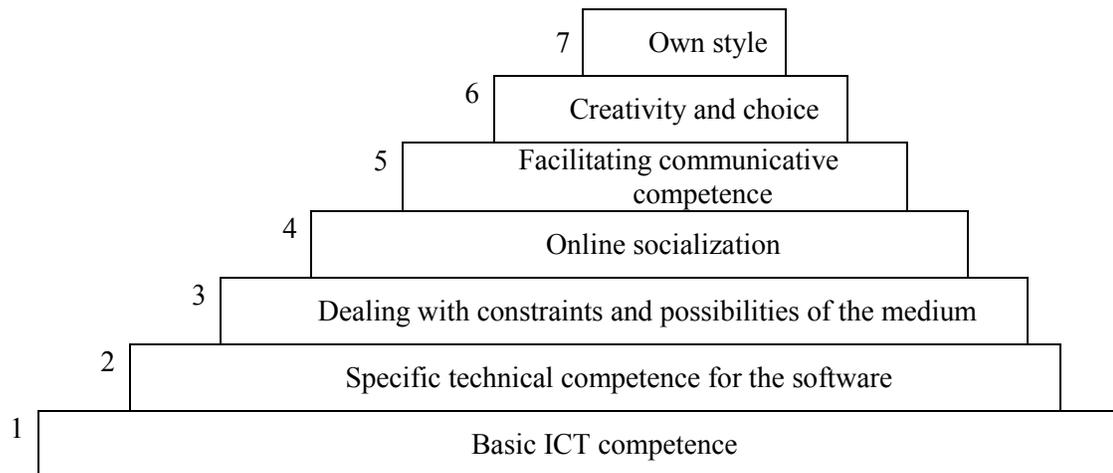


Figure 2: online language teaching skills pyramid (Hampel and Stickler, 2005)

Reflecting the bulk of research on online teacher preparation, though perhaps contrary to its theoretical focus, this model places technology related skills at the most basic level. Basic computer competence makes the other skills possible, but those higher-level skills take into account the full and rich potential of online learning. The base of the pyramid includes lower-level competences: basic ICT (information communications

technology) competence (level 1), specific technical competence for the software (level 2), and dealing with constraints and possibilities of the medium (level 3). The fourth level of skills relates to online socialization and community building, and Hampel and Stickler caution tutors to take extra care to ensure that all learners actively participate. The fifth level is effective facilitation of communicative competence. Creativity and choice are the sixth level, and these skills are crucial to the selection of "good, authentic language learning materials" and to the design of "online activities with the communicative principles in mind." The skill of creating new uses for online tools falls under this level as well. The highest level of skills for online language teaching relates to developing a "personal teaching style, using the media and materials to their best advantage, forming a rapport with students and using the resources relatively to promote active and communicative language learning."

Hampel and Stickler's model implies that these skills need to be developed sequentially, to "build on one another in a kind of pyramid, from the most general skills forming a fairly broad base to an apex of individual and personal styles" (p. 316). Compton (2009) argues that these skills can be developed concurrently as, for instance, "online socialization and facilitation of communicative competence are both pedagogical issues that can be dealt with simultaneously or in any order." Furthermore, online language tutors (as opposed to teachers) need to be able to facilitate second language acquisition rather than online socialization, since interpersonal learner-content interactions do not involve online socialization with other learners or the instructor. Other limitations of the model include its failure to indicate when an online language tutor is ready to teach or to include "other important skills and competences of online language teaching, such as application of language learning theories, online language assessment and task evaluation" (Compton, 2009).

Compton (2009) proposes an alternative framework that divides online language teaching skills into three categories: a) technology in online language teaching; b) pedagogy of online language teaching; and c) evaluation of online language teaching. These categories offer a more holistic perspective on an instructor's role that does not limit it to skills needed in virtual classrooms, which were the focus of Hampel and Stickler's model. Each of the sets of skills is organized into three levels of expertise: novice, proficient, and expert, to form a continuum of expertise rather than absolute divisions (see Appendix 2).

As in the first level of Hampel and Stickler's pyramid, Compton's novice level in the technology category involves basic technological skills, with emphasis on becoming a proficient and confident user of technology for teaching purposes. The proficient and the expert levels for this category correspond to Hampel and Stickler's sixth level: creativity and choice. However, in Compton, choice is identified as proficient, while creativity is the highest-level skill in the technological category. A proficient teacher can find available software, make informed decisions, and overcome limitations. An expert teacher can use the features of existing applications that are not intended for online language learning to provide online interactions, and in some cases to create basic applications using programming skills.

Pedagogical skills are categorized into the same three expertise levels: novice involves knowledge, proficient involves application of that knowledge, and expert, involves creativity. The novice online language teacher has the knowledge to build an online community and promote socialization, to facilitate online interaction, to adapt language learning theories for online language learning, to design curriculum for online language learning, and to use appropriate strategies for online language assessment. The proficient teacher applies that knowledge into the practice of online teaching by choosing suitable materials and tasks, adapting theories and frameworks, and assessing language learning with a range of assessment methods. The expert teacher creatively adapts materials and tasks, facilitates online socialization, and assesses language learning. The highest level in Hampel and Stickler's model, own teaching style, corresponds expert teachers in this category.

The evaluation category is divided much like the pedagogy category: the emphases of the novice and proficient levels are knowledge and application, respectively. At the novice level, the teacher should have knowledge of different types of evaluation and of one or more suitable evaluation frameworks, while the proficient teacher can apply different frameworks and use various strategies, including modifications if learning outcomes are not met. Expert teachers are able to integrate different methods and frameworks to conduct evaluations, and evaluations become intuitive, even sometimes subconscious.

Sun (2011) critiques both Hampel and Stickler's and Compton's frameworks, arguing that neither offers the necessary details that would directly apply to an online language teacher's practice:

... what [Hampel and Stickler; and Compton] have painstakingly drawn up for online teachers is, nevertheless, very much lacking in details. A frustrated overnight-classroom-turned-online-teacher could find very few practical guidelines or immediate help in their proposals. The answers as to what to do and how to do it, or what *not to do* are still anyone's guess.

Both Hampel and Stickler's and Compton's models cover general practices of online teachers. Guichon's (2009) framework focuses on identifying key competencies language tutors need to manage synchronous online teaching:

- (1) The competency of socio-affective regulation: refers to the capacity to establish a relationship with a learner or a group of learners, to maintain it despite distance, and to eventually build a learning community.
- (2) The competency of pedagogical regulation: concerns, first, the capacity to design learning scenarios adapted to distance that truly engage learners emotionally and cognitively, and, second, to manage learning experiences by providing feedback tailored to learners' individual needs.
- (3) The competency of multimedia regulation: relates to the interfacing role of the online tutor who has to learn to use the communication tools that are the most

appropriate to the learning scenarios, and to manage the ensuing interactions with the most adequate modalities.

Stickler and Hampel (2015) clarify that in their model, higher-level skills are built on accomplishment of lower level skills, although the levels are not necessarily achieved in chronological order. They thus adapt their earlier model to focus more on levels beyond the basic ICT competence.

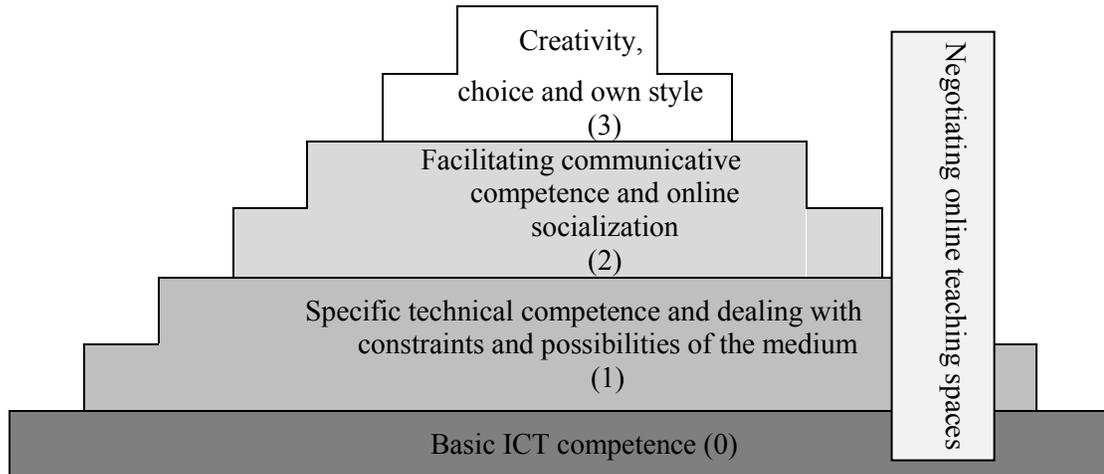


Figure 3: Skills pyramid (adapted)

Once teachers possess the specific technical competence and awareness of the constraints and possibilities of the different tools (level 1), they are able to make decisions that match pedagogical goals and technological tools.

Skilled level 2 teachers demonstrate competencies in developing social cohesion and fostering communication in online settings. They address the different spatial and temporal characteristics of an online setting, along with the resulting different rules of engagement, in order to cultivate engagement and communication successfully. Asynchronous online environments may lead to miscommunication and missed opportunities for communication due to wrongful interpretation and lack of social consequences of not engaging in a topic (Stickler et al., 2007; Ware, 2005): online teachers help language learners develop both linguistic skills and social and interactive skills by discovering common goals, supporting them in various forms, and ensuring an unthreatening environment for interaction.

Creativity in the highest level of the pyramid refers not only to teachers' creativity in making language practice varied and interesting (Richards, 2013), but also to supporting learners' creativity in language learning, namely tentative utterances, mediating between learners, and facilitating comprehension. Stickler and Hampel offer a list of specific ways in which teachers of online language classes can foster students' creativity:

- Selecting creativity-enhancing (online) tools

- Introducing and supporting the use of these tools without over-emphasizing the technological aspect
- Ensuring that creativity is a necessary element of all learning
- Explaining the pedagogical value of creativity in language learning
- Providing supportive evaluation and positive feedback
- Clearly demonstrating the delineation between re-use and plagiarism
- Furthering critical self-evaluative skills in learners

A new element of "negotiating online teaching spaces" is added to the skills pyramid: Stickler and Hampel explain that "defining a space as a 'learning space' is important in order to avoid misunderstanding, confusion of purpose and unacceptable behaviors." In other words, both students and teachers should be clear about rules for language use and assessment and guidelines for correct usage of tools. This crosses all skill levels, as rules should always be present in different level classrooms.

Stickler and Hampel conclude, "If teacher trainers can highlight the benefits of a collaborative construction of knowledge, link collaborative creativity to constructive pedagogy, and show clearly how to fully exploit the benefits of digital technology, this truly has the potential to advance online language pedagogy."

Following the above concluding remarks, this study responds to Sun's (2011) call for empirical studies that shed light on the detailed implementation of research-supported best practices for effective online language teaching. Specifically, it documents how teachers develop readiness skills and apply best practices to daily online synchronous teaching to meet expected curricular and programmatic goals. It begins to fill the gap between theory and practice and provides a valid account of the skills language teachers need for online language teaching and how they develop these skills to deliver real-time synchronous sessions. Asynchronous and synchronous components are hypothesized to be equally valued and important for online teaching. However, due to the limited length of the study, this paper focuses on synchronous real-time instruction. Moreover, this study adopts the three categories articulated in Compton's (2009) framework to guide the design and planning of the teacher training model for online teaching: technology, pedagogy, and evaluation. Although Guichon (2009) addresses and adds features for collaborative construction, that framework is geared toward online tutors instead of instructors. The lack of description for expected competence levels also limits its application to the program under study.

3. Method

Considering skills in light of Compton's (2009) framework, in the category of technology, teachers in the program were expected to demonstrate ability to use the online interactive platform and learning management system and to develop increasing independence and autonomy to select interactive technology tools within the online platform. In the category of pedagogy, teachers were expected to cyclically apply STARTALK endorsed principles for effective teaching and learning to lesson planning, teaching, observation, and reflections in different phases of program. With training and

practice in the program, teachers would move from the novice level of competence toward proficient, as evidenced by their ability to apply their knowledge to their online teaching practice, according to Compton's categorization. Teachers were not expected to achieve the same level of competence in the category of evaluation upon the completion of the program, as evaluating task and course design is out of the scope of the development of skillsets in the training program. The online course that teachers learned to teach in this program was pre-designed and pre-determined by the onset of the training program. All skillsets that teachers were to develop for online synchronous teaching centered upon the fulfillment of curricular and programmatic goals that were created by teacher trainers, but not by teacher participants. The limited time span and pre-designed curriculum and technologies prevented teacher participants from evaluating task and course design through one or more frameworks.

This study is the very first its kind to assess the development of required skills for online teaching through a blended training model specifically created for Mandarin Chinese language teachers in the US. Technology and pedagogy are the primary domains for the development of teachers' skillsets under study. The program employed a variety of formative and summative assessments, both quantitative and qualitative, to keep track of participants' progress toward newly gained knowledge and skills before, during, and after the program. The assessments that the training program implemented were multifaceted, including self-assessment checklists; UVaCollab Online Discussion Forum; online teaching; self-reflections and peer observations; classroom discussions, group projects and presentations and micro-teaching demonstration; and e-portfolios that highlighted their professional development and included the following eight components: cover page, teaching philosophy, curricula vitae, selected lesson plans, sample materials, videotaped teaching demonstration, self-reflections, and future professional goals. All types of assessments provided valuable data to further our understanding of how teachers progress toward effective online teaching. Due to the limited length of this paper, it is impossible to document the results of all types of assessments. This study therefore narrowed its scope to examine teachers' development of required skills for online teaching in Mandarin Chinese through only two types of assessments, self-assessment checklists and self-reflections in e-portfolios. Teachers completed the self-assessment checklists before the program started and after the program ended. They also completed self-reflections during the program. The former provided data for quantitative analysis, and the latter offered a wealth of information for qualitative analysis based on a total of 98 entries of self-reflections. This combination of quantitative and qualitative analyses provides a solid basis for the examination of the development of required skills for effective online teaching in Mandarin Chinese.

3.1 Context

Funded by a federal STARTALK grant in 2016, the program described in this paper took full advantage of current technologies and used an innovative pedagogical approach. It reflects the most recent research findings for effective instruction, aligning with the following principles for effective teaching and learning advocated by the STARTALK Central:

- Principle 1: Implement a standards-based and thematically organized curriculum
- Principle 2: Facilitate a learner-centered classroom
- Principle 3: Use target language and provide comprehensible input
- Principle 4: Integrate culture, content, and language
- Principle 5: Adapt and use age-appropriate authentic materials
- Principle 6: Conduct performance-based assessment

3.2 Participants

Twelve Chinese language instructors were recruited nationwide through a rigorous selection process. All participants were female and had three to eight years of experience teaching Mandarin Chinese in secondary and post-secondary educational settings in the US that included some combination of online, blended, and face-to-face instruction. Of the twelve teachers, five taught at universities, five in high schools, one in middle school, and one in elementary school. Their mean age was 35.8 years. All had master's degrees in various disciplines, and one was pursuing her doctorate in instructional technology with a concentration on foreign language education. Nine had received their teacher certificates in Mandarin Chinese in various states; one had completed required exams and was in the middle of applying for the certificate; and two did not have certificates. Four had experience teaching Mandarin Chinese online, with their online teaching experience ranging from one to four years. Of those four, one taught online in college and three in high schools. None of them used WizIQ as the online platform to deliver online instruction. All twelve had prior knowledge and skills in implementing online technology tools in teaching, and all demonstrated willingness to work collaboratively in exploring online teaching in Mandarin Chinese at the intermediate-low level according to the Proficiency Guidelines advocated by the American Council of the Teaching of Foreign Languages.

3.3 Teacher Training

In a survey on information and communication technology in relation to online world language teaching in Europe, Germain-Rutherford and Pauline (2015) found that teachers preferred a combination of online and face-to-face (F2F) training over either one individually. In their study, the majority of teacher participants welcomed hands-on training featuring concrete examples and activities. When the teachers who participated in the study were given a choice of training types, 80% supported a blended training model with a combination of online and face-to-face modules, 73% voted for face-to-face training, and 61% preferred a fully online training program. Building on that finding, the program created an innovative blended model that used both online and onsite training to prepare Chinese language teachers to teach online.

The summer teacher program involved five weeks of training. After two weeks of online training, teachers participated in three weeks of onsite training. The two-week online training included instruction in principles for effective teaching and learning, training in the online platform, and use of technological tools. Instructional modules closely aligned with program goals.

The three-week onsite training featured interactive workshops through which teacher trainees kept abreast of the most recent developments in evidence-based best practices for online teaching and learning. It consisted of one week of preparation followed by two weeks of a practicum, in which pairs of participants taught high school students online; the practicum was the core and focus of the program. For the last two weeks of the five-week teacher program, participants taught high school students online.

For the practicum, teachers were paired based on their backgrounds and experiences. The two teachers in each pair alternated between teaching and supporting roles. The supporting role engaged in technology trouble-shooting, classroom management, and other onsite logistics, as well as serving as a backup teacher in case of technology issues and observing her partner and completing a feedback sheet that she shared with her. Roles reversed every other day. Thus, for each day of the practicum, six teachers conducted online teaching while the remaining six teachers supported and facilitated that teaching. Days were divided into two sessions, with two students in the early session and four students in the later session. The practicum included thirty-five high-school students, whose targeted proficiency levels ranged from novice-high to intermediate-low at the entry point and who attained proficiency at the intermediate-low level at the exit point. During the practicum, all the teacher participants worked together to prepare lesson plans, rehearse teaching, and receive feedback from their peers and the program instructional team, which included teacher trainers, a technology coordinator, and practicum facilitators.

3.4 Teacher's Role

The teacher participants' major responsibilities during the practicum were: to deliver two-hour synchronous teaching sessions through the interactive online interactive platform WizIQ on a daily basis; to give feedback to students on their daily review assignments and tasks; and to respond to students' inquiries through the Group Board in the learning management system, in order to establish a strong rapport with the students. Program assistants conducted afternoon tutorial sessions. This allowed teacher participants to concentrate on their teaching preparation and online delivery, following daily program and curricular goals.

3.5 Instructional Technology

WizIQ was selected as the central online interactive platform for teacher participants to deliver daily real-time synchronous teaching, because of specific advantages over the other two widely used online platforms, Adobe Connect and Zoom. WizIQ's multifunctionality and potential to cultivate a student-centered fun online environment are clear in its design. Its user interface shows a vertical tool bar on the left side of the screen, with tools ranging from a simple drag-and-drop, marker, and eraser, to emoji icons. The center of the screen can support a range of instructional materials, from a PowerPoint presentation, to a spontaneous and/or pre-planned whiteboard, to video materials. The right side of the screen includes a live-stream headshot view of the learners and the teachers, a list of present participants, and a chatbox in which students can report technical issues, ask questions, and help teachers elaborate on words and

phrases as necessary. In addition to WizIQ, Zaption and Quizlet were used as technology tools to create flipped learning components for the program, and Padlet and Flipgrid were used to upload after-class review tasks.

3.6 Data Sources

Before the onset of the program and after its conclusion, all twelve teacher participants completed a detailed self-assessment checklist (see Appendix 1). During the practicum, teacher participants used the same form to prepare for online synchronous sessions and observe their peers. The form is divided into the following four general statements, which is then subdivided into components or items. The tools mentioned in the fourth category refer to technology tools, whereas the items in the first three categories pertain to pedagogical effectiveness that is achievable through the use of those tools.

1. Daily performance objectives are focused on proficiency targets and meaningful contexts.
2. Activities enable students to assess their attainment of the lesson's language objectives.
3. Activities enable students to meet daily performance objectives.
4. Through the learning tools, has the instructional objectives been achieved?

For each item, or specific task, within the above four categories, teachers chose one of three accompanying boxes to indicate their confidence in their ability to perform that task. The boxes were marked NC (not confident), PC (partially confident), and FC (fully confident). Complementing the quantitative analysis yielded by percentage of teachers choosing each box, qualitative analysis was based on teachers' self-reflections, one of the nine components in their e-portfolios. All twelve participants wrote self-reflections to keep track of their teaching and observations about their understanding of online teaching and teaching experiences during the program.

4. Results and Discussions

The following discussion summarizes the results of quantitative analysis, as expressed in the following five tables. They are supplemented by qualitative analysis, wherever applicable and relevant, through teachers' self-reflections on the targeted items of the tables under study. Each table presents frequencies and percentages regarding teachers' pre-program and post-program self-assessment and compares their growth in each item during the program. Teachers' self-reflections on their grasp of key concepts and application of principles for online teaching are used to enhance a deeper understanding of the underlying meaning of the figures presented in the tables.

All twelve participants completed the pre-program and post-program self-assessment checklists. They were given a statement or question with three choices, indicating confidence level: 1. NC=Not Confident, 2. PC=Partially Confident, and 3. FC=Fully Confident. The self-assessment criteria were divided into the four categories listed above. The first category focuses on daily performance objectives and is further

broken down into two subcategories, the first of which investigates the relationship between daily performance objectives and proficiency targets. Table 1 summarizes the frequencies and percentages of teachers' responses in the pre-program and the post-program self-assessment checklist.

Table 1: Pre-program and post-program confidence in Category 1a, "Daily performance objectives are focused on proficiency targets"

Item	Pre/Post	NC	PC	FC
1: Learning targets clearly state what students will know and be able to do by the end of the lesson	Pre	1 (8.33%)	1 (8.33%)	10 (83.33%)
	Post	0 (0%)	0 (0%)	12 (100%)
2: Well-organized/sequenced targets for students to show mastery at lesson's end	Pre	2 (16.7%)	3 (25%)	7 (58.33%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)
3: Students understand the learning targets	Pre	2 (16.67%)	0 (0%)	10 (83.33%)
	Post	0 (0%)	0 (0%)	12 (100%)

NC: Not Confident; PC: Partially Confident; FC: Fully Confident

Table 1 depicts teachers' self-evaluation of their confidence in each item in the general category, "Daily performance criteria are focused on proficiency targets." Results indicate a clear improvement over the course of the program in participants' confidence levels in all three items. For items 1 and 3, 83.33% of the participants felt fully confident before the program began, and all participants were fully confident after completing it, suggesting that all teachers were comfortable in their ability to state learning targets clearly and to closely align instructional delivery with those targets. However, before the program began, only 58% of the teacher participants were fully confident in item 2, their ability to teach students to show mastery at lesson's end through well-organized and well-sequence targets. Responses to this category show the highest percentage of "not confident" and "partially confident" prior to the onset of the program. Responses from the post-program self-assessment show that participants' confidence significantly increased after completing the program: 91.67% of participants felt fully confident, with only one teacher feeling partially confident.

The above three items in Table 1 closely relate to can-do statements that teacher participants generated during the first stage of backward designing, i.e., identifying desirable results or learning goals. In other words, the items can be interpreted as: can-do statements were clearly articulated (Item 1), well-sequenced and organized (Item 2), and understood by students (Item 3). They preceded, governed, and connected with the other two stages of backward designing in the remaining tables, i.e., determining acceptable evidence in how to access learners' performance, and planning learning experiences and instructional delivery. Items in Table 1 are central questions that teachers kept in mind in preparation for assessments in Table 3 and instruction for their practicum in Tables 2, 4, 5.

In teacher participants' self-reflections, teachers unanimously echoed that backward design was crucial for lesson planning. One teacher explained the flow of backward design and put that "[a]s we planned a lesson in the UVa STARTALK program, we always kept the learning targets and the ending performance tasks in mind. The last step we did in lesson planning was to think of what activities could best engage students and provide more opportunities for interactions between students." Recognizing the importance of starting from learning goals and sticking to them from the beginning till the end, another teacher commented that "[b]ackward designing helps teachers stay focused on the goals when planning a lesson. It is very important to bear in mind with the teaching objectives at all times as they also help with the design of engaging activities and tasks."

Table 2: Pre-program and post-program confidence in Category 1b, "Daily performance objectives are focused on creating meaningful contexts."

Item	Pre/Post	NC	PC	FC
1: Real communication focus, not grammar in isolation	Pre	1 (8.33%)	4 (33.33%)	7 (58.33%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)
2: Target language used for real-life purposes	Pre	1 (8.33%)	3 (25%)	8 (66.67%)
	Post	0 (0%)	0 (0%)	12 (100%)
3: Target language suitable for students' comprehension level	Pre	1 (8.33%)	5 (41.67%)	6 (50%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)

NC: Not Confident; PC: Partially Confident; FC: Fully Confident

The above table shows the results of the second half of the first category of self-assessment, which focuses on whether teachers were able to teach in meaningful contexts as their daily performance objectives. Pre-program results show a higher difference in confidence levels in the second subcategory (1b) than in the first subcategory (1a): before completing the program, one-third to one-half of the participants did not feel fully confident in each statement, which shows that focusing daily targets on meaningful contexts was difficult for some participants to achieve on their own. However, after completing the program, all or nearly all of the participants felt fully confident in their abilities to teach in meaningful contexts.

Using the target language to generate comprehensible input for students is easier to say than do. During the practicum, one teacher began her first entry of self-reflections by describing the teaching demo video created by a practicum facilitator as a great example of "how to design, organize, order, and implement wonderful teacher-led scaffolding techniques to lead students to the i+1 level through the use of the target language." The "i" in the well-known phrase "i+1," meaning comprehensible input, refers to students' current comprehension level. "1" refers to moving one step further beyond students' current comprehension level. Before the program, many teachers had doubts

about using Mandarin Chinese almost exclusively in teaching. For example, one teacher confessed that switching to the use of the target language in class was a painful experience, but more than rewarding. Before she participated in the program, "the temptation of speaking English or give pinyin on PPT happened every day in her class." She did not see the harm in giving students English translation on PPT or supplying English phrases verbally. Neither did she realize that the way that she taught grammar in English, devoid of meaningful context, did little to help students achieve productive language output and perform the target language in a performance-based class. At some point during the program, it started to dawn on her that she did not phrase questions appropriately and that her habit of talking too much prevented her class from being communicative, interactive, and performance-based. After receiving training from the program, she wrote in her final entry that she would be able to "maximize her class time more efficiently" after she returned to her school. At the end of the program, the teachers unanimously agreed that it was very informative for them to apply the "i + 1" principle using three types of elicitation techniques to elicit meaningful output: mechanical drills, meaningful drills, and communicative drills.

Table 3: Pre-program and post-program confidence in Category 2, "Activities enable students to assess their attainment of the lesson's language objectives."

Item	Pre/Post	NC	PC	FC
1: Encouragement and descriptive feedback	Pre	2 (16.7%)	2 (16.7%)	8 (66.67%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)
2: Feedback from varied sources	Pre	3 (25%)	5 (41.67%)	4 (33.33%)
	Post	0 (0%)	2 (16.7%)	10 (83.33%)
3: Formative assessment checks throughout the lesson	Pre	1 (8.33%)	2 (16.7%)	9 (75%)
	Post	0 (0%)	2 (16.7%)	10 (83.33%)
4: Feedback on progress toward learning targets throughout the lesson	Pre	2 (16.7%)	3 (25%)	7 (58.33%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)
5: Learners have the ability to assess their own learning	Pre	2 (16.7%)	7 (58.33%)	3 (25%)
	Post	0 (0%)	4 (33.33%)	8 (66.67%)

NC: Not Confident; PC: Partially Confident; FC: Fully Confident

Table 3 shows data on teachers' confidence in whether the activities that they designed and conducted would enable students to assess their own attainment of the lesson's language objectives. Pre-program results show that the majority of participants felt fully confident in items 1, 3, and 4, which all have to do with feedback or assessment interactions between teacher and students. When assessment was independent of the teacher, however, teachers were less confident. Before the program, less than half of the teachers felt fully confident in items 2 and 5, suggesting that they had little confidence in their abilities to provide various sources of feedback to students and to develop students' ability to assess their own performance. Although teachers gained confidence, even after completing the program, about one-third still lacked full confidence in learners' ability to self-assess. This may be due partly to the immaturity of high school learners and the short length of the summer program, especially as the increase in teachers choosing "fully confident" for item 2 was significant (from 33.33% pre-program to 83.33% post-

program): item 2 has to do with teachers' abilities to provide feedback from various sources, while item 5 is strictly about teachers' abilities to teach and encourage students to self-assess.

Comparing Table 3 to Tables 1 and 2, it is clear that the results of the pre-program self-assessment for items 1, 3, and 4 in Table 3 are more consistent with the results in Tables 1 and 2: even before the program, more than half of the participants were fully confident in their self-assessments in these three items. This pattern does not hold for items 2 and 5.

It is important to note an interesting feature of response data for item 3, which measured teachers' confidence in their ability to give formative assessment checks throughout the lesson. Pre-program results for item 3 show that the majority (75%) of participants felt fully confident to begin with, and post-program results did not demonstrate a significant improvement: the number of teachers indicating full confidence increased only a little bit (75% to 83.33%), and although the percentage of participants who were not confident decreased from 8.33% to 0.00%, the percentage choosing partially confident remained the same (16.67%). One possible interpretation for this is that in the study, formative assessment checks included checks during both synchronous teaching and asynchronous self-paced learning that were supposed to be independently completed by learners themselves. After the practicum began, teachers diverted their full energy to online synchronous teaching, resulting in more focus on real-time checks than on monitoring learners' progress in their after-class assignments, which were partly the responsibility of the program assistants and teaching assistants. Unlike item 3, item 4 (providing feedback to students' progress) shows a much higher percentage (58.33%) in teachers' level of full confidence in their pre-program self-assessment and a higher percentage (91.67%) post-program as well, indicating a significant growth in confidence.

Interestingly but not surprisingly, the above items concerning assessments in Table 3 received very few reflective notes in teachers' daily self-reflections. During the practicum, teachers tried to develop students' can-do attitude through a positive mindset, and this contributed to the fulfillment of the first item, on providing encouraging oral feedback or visual clues such as emojis right in the initial practicum phase. Apparently, this was an easily achievable goal for teachers. Another point worth addressing here is that the program offered zero credits for students, so teachers did not create rubrics, checklists, or scoring guidelines to establish the kind of rigorous grading system that is normally required for credit-granting courses offered in a regular academic year.

The only area in which teachers indicated a lower confidence level after receiving intensive training through the program was in developing learners' ability to assess their own learning. This may be due to the fact that some of the formative assessments were supervised by program staff and assistants, and teachers were not directly involved in checking students' after-class review work. In addition, when students participated in the online learning program toward the end, they actually received online training by the program assistants and followed instructions to complete their individual online LinguoFolio self-assessment profiles before exiting the program. Since this was not handled by teacher participants themselves due to their key responsibility for delivering

online synchronous teaching, teachers may not have been fully aware of improvements in learners' self-assessment, resulting in lower confidence levels.

Table 4: Pre-program and post-program confidence in Category 3, "Activities enable students to meet daily performance objectives."

Item	Pre/Post	NC	PC	FC
1: Age appropriate	Pre	1 (8.33%)	0 (0%)	11 (91.67%)
	Post	0 (0%)	0 (0%)	12 (100%)
2: Level appropriate	Pre	1 (8.33%)	4 (33.33%)	7 (58.33%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)
3: Activity instructions are clear and easy to follow	Pre	1 (8.33%)	5 (41.67%)	6 (50%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)
4: Activities are meaningful and communicative-oriented	Pre	1 (8.33%)	4 (33.33%)	7 (58.33%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)
5: Multiple and various activities	Pre	2 (16.7%)	4 (33.33%)	6 (50%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)
6: Tasks provide a reason for engaging	Pre	1 (8.33%)	2 (16.7%)	9 (75%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)
7: Teacher models language production	Pre	1 (8.33%)	2 (16.7%)	9 (75%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)
8: Sufficient opportunities for understanding learned materials (input) before production (output)	Pre	1 (8.33%)	5 (41.67%)	6 (50%)
	Post	0 (0%)	2 (16.7%)	10 (83.33%)
9: Evidence of careful planning to manage activities in the virtual classroom	Pre	3 (25%)	2 (16.7%)	7 (58.33%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)
10: Activities build toward mastery through a logical sequence	Pre	1 (8.33%)	5 (41.67%)	6 (50%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)

NC: Not Confident; PC: Partially Confident; FC: Fully Confident

Table 4 shows results for items in Category 3, which relates to activities that enable students to meet daily performance objectives. After the program, most (83.33% or above) participants were fully confident in their experiences and none were not confident, indicating that the program increased their confidence level in objective implementation and achievement.

Results from the pre-program assessment show that items 3, 5, 8, and 10 were the most difficult to implement prior to the program, as only half of the participants started out fully confident in the statements. Examined as a group, these items focus on meaningful and effective arrangement of diverse and various activities. Item 9 also stands out, as 25% of the participants did not feel confident at all in their ability to provide evidence of careful planning to manage activities in the virtual classroom.

The results of the post-program self-assessment show significant improvements for the items mentioned above. None of the participants felt not confident, and 91.67% felt fully confident for all items except for item 8: 16.67% of the participants felt partially confident in their ability to provide sufficient opportunities for students to digest input before output.

During the practicum, each single one-hour online teaching session was a group effort that required many hours of preparation. While team spirit building created synergy among all members in the group, shared effort in teaching preparation built a strong teaching community and substantially enhanced the quality of activity design. This explains the high confidence level of the items in the above table upon the completion of the program. Not only did teachers collectively prepare for Powerpoint slides as the vital medium for online real-time teaching, but they also rehearsed the lesson each day before giving it in the practicum, using the PowerPoint files that they created to gather collective feedback from the group. The advantage of rehearsals, as one put it in her self-reflection, was to "help teachers see the big picture while focusing on details." Another teacher was inspired to reflect that "[t]he difference between mediocrity and excellence is attention to detail."

Group preparation and rehearsals greatly contributed to the successful design and diversity of interactive online activities. For example, one teacher created a chart in the shape of a pyramid while teaching a comparison structure on school life, with the most difficult course on the top and the least difficult one on the bottom. The chart was vivid and visually clear, so it enabled students to easily compare subjects on the top and at the bottom. Another teacher elaborated that the two videos that she adopted to teach extracurricular activities, one named "little apple," a very popular video in China, and the other Chinese Kong Fu, were extremely eye-catching and engaged students to fully use their senses. She also encouraged students to stand up and dance along with the song while watching the video. This activity helped both teacher and students to relax and revive with dynamic physical movements. The activity was followed by a question that explored students' critical thinking: "Which performance do you like and why?" This question enhanced students' language output on the comparison structure, the key structure in that day's lesson objectives, and concluded the lesson with joy and vitality.

One of the most successful activities was related to food. One teacher reflected that this activity was carried out with great fun and highest level of involvement. Students visualized what a Chinese hotpot was like and demonstrated the steps to eat and cook food in the hotpot after watching a video of a very famous restaurant at Donglaishun where hotpots were served. Teachers used Quicktime Player to voiceover the authentic video image using familiar vocabulary and phrases from the text. The result was wonderful! The video image definitely enhanced comprehensibility of the text. A group of teachers also found another video in English of two male students describing how to pick hotpot ingredients and the process of cooking them. When she voiced over this video, the addition of a female voice had an odd effect. Her team came together to help, and one team member got a voice recording from her husband, which made the voice-over feel much more natural. These videos definitely gave students an authentic sense of being in a hotpot restaurant, ordering hotpot ingredients, and cooking them in order, at the same time learning and practicing Chinese conjunction words that connect actions such as "first," "then," and "lastly."

Activity design is inseparable from the incorporation of authentic materials and technology tools through the online interactive platform for the program. Thus, it is clear that most of the items in Table 4 interrelate to and interconnect with the third item in Table 5, using a variety of authentic materials to facilitate the understanding of the perspectives behind culture products and practices. With the rapid development of advanced technology nowadays making it possible, incorporation of online authentic materials has become a key element for effective online language courses.

Table 5: Pre-program and post-program confidence in Category 4, "Through the learning tools, have the instructional objectives been achieved?"

Item	Pre/Post	NC	PC	FC
1: Evidence of using a variety of learning tools to help learners ACCESS language, culture, and content to meet performance objectives in three modes	Pre	2 (16.7%)	6 (50%)	4 (33.33%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)
2: Evidence of using a variety of applications to help learners PRODUCE language, interact with culture and content to meet performance objectives in three modes	Pre	2 (16.7%)	5 (41.67%)	5 (41.67%)
	Post	0 (0%)	2 (16.7%)	10 (83.33%)
3: Evidence of using a variety of authentic materials to facilitate the understanding of the perspectives behind culture products and practices	Pre	3 (25%)	5 (41.67%)	4 (33.33%)
	Post	0 (0%)	1 (8.33%)	11 (91.67%)
4: Use available technologies, via the	Pre	2 (16.7%)	2 (16.7%)	8 (66.67%)

platform, to help learners engage and meet performance objectives	Post	0 (0%)	1 (8.33%)	11 (91.67%)
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NC: Not Confident; PC: Partially Confident; FC: Fully Confident

Table 5 shows results for items in Category 4, which focuses on the utilization of a variety of technology learning tools and authentic materials in achieving instructional objectives. Before the program, the number of teachers who felt fully confident across all four items was the lowest among all categories. This is not surprising, as these items tested teachers' familiarity with interactive technology tools within the online platform WizIQ, interactive tools within WizIQ, and other technology tools that enhance flipped-learning and after-class learning outside of WizIQ. Since the majority of teachers did not have online teaching experience, they had never used WizIQ to deliver synchronous teaching. Even the several teachers who had taught online language courses before had had no experience using WizIQ. Post-program responses reveal a notably big increase in each of the items. This demonstrates the program's efficacy in developing teacher skills and ability through intensive training and substantial hands-on experiences. Overall, post-program results show a significant boost of confidence in all categories. Over 80% of teacher participants felt fully confident in their abilities to use technology effectively at the end of the program.

The online learning program in the study features three-stage learning: flipped learning, in-class real-time synchronous learning, and after-class learning. The design of flipped learning is one of the best practices that some teachers said that they would bring back to their own schools for future use and modification. The flipped learning components included a self-study guide, video and sound recording for matching characters and Pinyin, Quizlet, and interactive Zaption videos. Students watched Zaption videos, learned through three types of stimuli, (multiple choice questions, matching exercises, and free response questions), and then typed responses right after seeing each question on the video screen. At the end of the video, students were able to see their scores and performance. Several teachers expressed recognizable pedagogical values of the interactive Zaption videos, and one teacher commented that without pre-learning the Zaption videos, students were able to learn what they self-learned, pre-class flipped learning customized the pace of instruction and influenced the way that materials were taught. This, as one teacher reflected, created a positive tone taught. This, as one teacher here students do most of talking, writing, and thinking." Another teacher felt truly amazed by her students positive tone taught praised flipped learning as a contributing factor, as she expressed in her reflection journal. She reflected that students were much more engaged and knew exactly what to expect in class. She also noted that learning through Quizlet on vocabulary and content through Zaption videos and handouts already helped teachers do most of the teaching, so during the online class, students were able to practice major grammar points and use language to express ideas and opinions communicatively. In addition to flipped learning design, the technology tools that were adopted for after-class learning, padlet and flipgrid, were also considered new fresh experiences for many of the teachers. The teachers unanimously acknowledged that getting familiar with the newest technology tools was one of their delights in the program.

The program offers many takeaways for teacher participants in terms of the use of interactive technology tools. At the end of the program, one teacher summarized a comprehensive list of the tools she planned to apply to her future classes, including WizIQ, Zoom, screen-cast, flipgrid, padlet, canvas, Zaption, Quicktime player, and YouTube. Before she participated in the program, her YouTube account had no videos at all, and toward the end of the program she had 34 culturally relevant videos in the target language. She could not wait to try out these technology tools with her students, and she came up with concrete plans to enrich her class that included using YouTube to find authentic materials, and using Quicktime player and Zaption to create flipped materials. In line with program activities, she planned to use flipgrid and padlet to post oral and written homework assignments. Wise use of technology tools is beneficial not only for online teaching; it can facilitate face-to-face and blended instruction as well. Many teachers echoed such a statement and several used described their experiences with online technology tools as "eye-opening."

Teachers' post-program reminiscences summarize their perception of what knowledge and skills they learned for online teaching. All twelve teachers submitted reminiscences that offered a holistic view of the impact of the blended training program on their development for online language teaching effectiveness. One teacher concluded that the program had transformed her into a "significantly more impactful teacher." She improved in "applying backward design methods in lesson planning, using 100% of target language and authentic materials, and creating student-centered interactive activities." Another teacher gave a broader sense of her development at both the professional and personal levels:

"After this program, I become more attentive to details for instructional design and delivery. I had the chance to hone my elicitation skills and to observe how other teachers taught to help students generate maximal output. Personal spiritual enrichment-wise, I learned to have a growth mindset, which could not only be applied for teaching but also for a broader spectrum-life."

Pedagogical effectiveness was a main subject in teachers' self-reflections, especially in terms of its basis in the versatility of interactive technology tools. Based on the quantitative and qualitative analyses documented above, it is evident that teachers successfully acquired knowledge and skills needed to deliver online instruction despite varying degrees of initial confidence. The five-week intensive training for online teachers in Mandarin Chinese concluded with expectations satisfied. Transforming ideals to reality from F2F to online teaching is bold; the adventure of the blended training model was found to be effective and a very good investment for the preparation of online Chinese language teachers. After profound retrospection, it is hypothesized that the keys to the success of teachers' developed skills and confidence include, but are not limited to: program staff's full commitment to the program; their appropriate handling of program planning, implementation, and instructional design; teacher participants' determination to strive for excellence; and the successful recruitment of highly-motivated students nationwide.

One year before the program started, the core team started to plan for the five-week teacher training program. They met on a regular basis, both online or face-to-face, to investigate and determine programmatic pedagogical and technological needs. The decision making on different sets of technology tools went through several stages of discussion, planning, and testing, until the team felt that it reached a level of satisfactory stability and security. Workload for curriculum design and material development was huge, intensive, and very detail-oriented before the onset of the program. The screening process of teacher recruitment ensured the successful recruitment of twelve dedicated and passionate teachers, who were willing to explore the innovative model of online instruction by working with their peers and the core team. Each teacher's individual pace of professional growth was well respected and thoughtfully considered, resulting in careful pairing and grouping for discussions, microteaching, and online teaching-in-action. Through pre-program analyses and interactions, the core team was able to identify different individual needs and levels of competence in pedagogy and technology use among the teacher participants. This tremendously helped with many aspects of program preparation before and after the program moved toward the phase of practicum.

The program team carefully implemented the blended training model for both online and onsite training components. The two-week online portion of the program was clearly connected to the onsite content. Teacher participants were made aware of the curriculum template for the student program, and mini-teaching demonstrations in week 2 focused on aspects of the template. The first week onsite allowed participants to begin to plan lessons. All participants benefitted from the three-day cycle, which included lesson planning in pairs and groups, rehearsing, teaching in action, and receiving feedback and self-reflections. The cycle also created a balanced workload with teachers teaching only every other day. PowerPoint was integral to lesson design, and participants discussed and received feedback on the quality of their slides with a focus on designing slides that presented information clearly and in an interactive format appropriate to the online learning environment.

The program intentionally limited teacher participants' role to lesson design and online delivery. This allowed teachers to focus on online teaching without the challenges of managing or engaging a large group of students in a summer intensive training program. The teacher participants were not involved in decision making on curriculum development, core instructional materials, materials for pre-class and after-class assessments, or selection of the interactive online platform and language management system. This ensured that they focused their synergized efforts on teaching according to daily can-do statements and required language components. Teacher participants received immediate and constant support from the core team at the administrative, pedagogical, and technological levels, especially from practicum facilitators, who worked very closely with teachers from initial brainstorming to the end of online teaching. All the above may be key factors that contributed to the satisfactory outcomes of teacher development in the program.

5. Conclusion

The intensive five-week training model for online teacher development was created for the teacher program in conjunction with the twelve-day student program. What worked well under this study may not work well for regular semester programs. Setting aside the differences between summer and regular semester training, the program designers had strong faith that a combination of online and onsite training would work best. It is risky to rely completely on online training for teacher development in online teaching because constant discussions, close supervision and monitoring, and interactions among teacher participants all serve as determining factors in developing a robust training program. Conversely, training teachers to teach online through a pure F2F training model makes it impossible for teachers to get a real feel for online interactions, not to mention the costs of summer residential programs that include lodging and food. The quantitative and qualitative data analyses provide strong evidence for the efficacy of the blended training model. Further studies might discuss the designs of teacher training programs, blended and completely online, and the training outcomes in preparation for teachers to teach online. Data sources that are used as evidence of developed readiness skills are crucial. It is recommended that a series of studies be carried out to analyze the outcomes of different types of assessments that are used to document teachers' teaching effectiveness in online teaching. The current study focuses on teachers' self-evaluation by looking into their pre-program and post-program self-assessment checklists and self-reflections. A follow-up study could expand assessment to the analysis of evaluations completed by peer teachers, practicum facilitators, and key trainers through other types of collected data and evidence. For example, analysis of teaching videos and other components in the e-portfolio would provide evidence to complement teachers' self-assessments and self-reflections discussed in this study. In other words, more evidence-driven studies are worth exploring in the near future. Another direction for future research is teachers' conceptions and attitudes toward transitioning F2F teaching to online teaching. The perceived differences and similarities between F2F and online teaching, and the related difficulties and challenges that teachers face, are topics with immeasurable value for the field of teaching Chinese as a foreign language with technology-mediated instruction, either blended or purely online. While an increasing number of virtual schools have been established in this technology-explosive era, there still lacks recommendations and guidelines for transitioning to an online teaching mode from a traditional F2F classroom. The current study has collected individual and collective thoughts in this regard, and those will be dealt with in a separate paper due to the limit of the length of the study.

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Appendix 1**2016 Virginia STARTALK Chinese Teacher Academy Online Teaching Evidence Form**

Teaching Effectiveness for Language Learning (TELL): Planning P6 and Learning Tools LT1, LT2 and LT3

Teacher: **Observation Date:** **Observation Time:**

Directions – For each criterion, click the appropriate box to indicate the degree observed. Click in the corresponding field to begin typing observational evidence for each criterion as appropriate. (**FO**= Fully Observed; **PO**=Partially Observed; **NO**=Not Observed; **NA**=Not Applicable)1, 2, or 3

Criteria	Degree Observed	Observed Evidence
1a. Daily performance objectives are focused on proficiency targets...		
Learning targets clearly state what students will know and be able to do by the end of the lesson	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Well-organized/sequenced targets for students to show mastery at lesson's end	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Students understand the learning targets	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
1b...and meaningful contexts.		
Real communication focus, not grammar in Isolation	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Target language used for real-life purposes	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Target language suitable for students' comprehension level	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
2. Activities enable students to assess their attainment of the lesson's language objectives.		
Encouragement and descriptive feedback	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	

Feedback from varied sources	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Formative assessment checks throughout the lesson	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Feedback on progress toward learning targets throughout the lesson.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Learners have the ability to assess their own learning.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
3. Activities enable students to meet daily performance objectives.		
Age appropriate	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Level appropriate	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Activity instructions are clear and easy to follow	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Activities are meaningful and communicative-oriented	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Multiple and various activities	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Tasks provide a reason for engaging	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Teacher models language production	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	

Sufficient opportunities for understanding learned materials (input) before production (output)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Evidence of careful planning to manage activities in the virtual classroom	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Activities build toward mastery through a logical sequence	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
4. Through the learning tools, have the instructional objectives being achieved?		
Evidence of using a variety of learning tools to help learners ACCESS language, culture, and content to meet performance objectives in three modes	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Evidence of using a variety of applications to help learners PRODUCE language, interact with culture and content to meet performance objectives in three modes	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Evidence of using a variety of authentic materials to facilitate the understanding of the perspectives behind culture products and practices	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	
Use available technologies, via the platform, to help learners engage and meet performance objectives	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FO PO NO NA	<p>Interactive whiteboard Media</p> <p>Poll Chat/conversation panel</p> <p>Hand raising teaching tools</p> <p>Emoji/symbol Others observed:</p>

Areas of Strength:
Areas of Growth:
Notes for instructional flow in chronological order Time allotment, what the teacher does, and what student(s) do

Appendix 2: Proposed framework of online language teaching skills (Compton, 2009)

		Online language teaching skills		
		Technology in online language teaching	Pedagogy of online language teaching	Evaluation of online language teaching
Continuum of expertise	Novice teacher	Basic technological skills (prerequisite) ↓ <u>Usage</u> Ability to use a range of software Ability to identify features of different software Understanding of constraints and possibilities of different software ↓	Knowledge of strategies for online community building and socialization Knowledge of strategies to facilitate communicative competence and online interaction Knowledge of language learning theories for online language learning Knowledge of curriculum design frameworks for online language learning Knowledge of strategies for online language assessment ↓	Basic knowledge of task evaluation Basic knowledge of course evaluation ↓
	Proficient teacher	<u>Choice</u> Ability to choose suitable technology to match online language learning task Ability to deal with constraints and possibilities of different software Ability to create basic Web pages Ability to troubleshoot basic browser problems ↓	Ability to foster online community and socialization Ability to facilitate communicative competence and online interaction Ability to choose suitable materials to match online language learning task Ability to apply language learning theories for online language learning Ability to apply curriculum design frameworks for online language learning Ability to assess language learning using different assessment methods ↓	Ability to evaluate online language learning tasks based on one or more frameworks and to modify tasks accordingly Ability to evaluate online language course based on one or more frameworks and to modify components accordingly ↓
	Expert teacher	<u>Creativity</u> Creativity in using and adapting technology for online language learning tasks Ability to construct interactive web pages Knowledge of basic programming language	Creativity in using and adapting materials to create new online language materials and tasks to facilitate communicative competence and online interaction Creativity in facilitating online socialization and community building Intuitive and integrated assessment of language learning	Intuitive and integrated evaluation of online language learning tasks based on one or more frameworks Intuitive and integrated formative evaluation of online language course

Developing Electronic Teaching Portfolios: A Way to Success for Preservice Teachers¹ (建立电子教学档案, 促进对外汉语教育)

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Abstract: This pilot study examines the role of the electronic teaching portfolio application in a Chinese language teacher education program content course. As part of the course requirements for *Supervised Teaching of Chinese*, ten graduate students developed electronic teaching portfolios via the open-source tool *WordPress*. In reporting the process and the product, we show that preservice teachers, while developing their portfolios, were directed to reflect on and think critically about learning objectives, thereby building competence and skills by the completion of the project. More precisely, these student teachers gained the following: (i) a better understanding of requirements for Chinese-language teachers in the real world; (ii) a greater commitment to a teaching career in the K-12 setting; (iii) improvement of high-level critical and reflective thinking; (iv) an increased sense of responsibility; (v) stronger English writing skills, and (vii) enhanced appreciation of professionalism. The results of this study show that having preservice teachers create e-portfolios encouraged and even empowered them to become more qualified teaching candidates. The effects of the skills gained as a result of this program will be discussed along with suggestions for enhancing Chinese-language teacher education.

摘要: 本文探讨电子教学档案在对外汉语教育课程中的应用。十名职前对外汉语教师借助 WordPress 创建教学档案, 其制作过程及成果显示, 建立个人档案是职前教师学习和自我提升的重要途径。具体而言, 他们的收获如下: (一) 对对外汉语教师的现实要求有了更好的理解; (二) 对 K-12 教学事业有了更大的承诺; (三) 提高了批判性思维能力; (四) 增强了教师责任感; (五) 提高了英文写作能力; (六) 提升了专业素养。研究表明, 要求职前教师建立电子档案可以有效地

¹ I thank Danielle Mirliss and William Otskey from the Teaching, Learning and Technology Center, Seton Hall University for their tremendous assistance with this project. I am also grateful to Michael Stone, Director of the Language Resource Center, for discussing some of the issues addressed in this paper and offering suggestions to clarify them.

帮助他们成为合格的对外汉语教育工作者。基于上述结论，我们就对外汉语教育如何应用电子档案提出了具体建议。

Key words: e-portfolios, Chinese language teacher education

关键词: 电子教学档案, 对外汉语教育

1. Introduction

American Council on the Teaching of Foreign Languages has proposed Program Standards for the preparation of foreign language teachers (ACTFL, 2002).² These standards mandate that preservice teachers be knowledgeable and skillful in six areas. Specifically, preservice teachers must, first and foremost, know the target language, linguistic structures, and the similarities and differences between the target language and other languages. In addition, they must be familiar with the cultures and the literature of the language taught, and understand cross-disciplinary concepts. Moreover, they should be familiar with language acquisition theories and instructional practices. They should also be capable of integrating standards into curriculum design and classroom instruction. They should be familiar with various methods for assessing language proficiency and understanding of cultures. Finally, the future teachers should engage in professional development and serve as advocates for the value of foreign language learning.

In order for preservice teachers to attain the knowledge, skills, and dispositions as described in the above standards, teacher preparation programs must not only include the required components in their curriculum, but more importantly, are able to demonstrate that their students have achieved these goals. For those involved in teacher training on the front end, the question is how to assess preservice teachers. In other words, what are the authentic and effective methods that assure us that our teacher candidates achieve the ideal objectives by the end of their training? One valuable tool that has been utilized in teacher education is having students create teaching portfolios (e.g., Jarvinen and Kohonen, 1995; Shulman, 1998; Martin-Kniep, 1999; Bullock and Hawk, 2001; Fasanella, 2002; Kilbane and Milman, 2003, McColgan and Blackwood, 2009; Struyven et al., 2014; Ogan-Bekiroglu, 2014; Kim and Yazdian, 2014; Demirel and Duman, 2015). A teaching portfolio, as defined by Armstrong et al. (2005) “includes evidence a teacher gathers to document what he or she has accomplished with a given group of learners over a period of time...” (pp. 416-417).

With advanced technology involving a variety of multimedia, it is now easier and effective for students to produce dynamic and engaging online portfolios by building individual classroom websites. These can contain a variety of material, even including videos of the students’ teaching demonstration. This kind of electronic portfolios

² The standards were first endorsed by the National Council for Accreditation of Teacher Education, and in 2013 approved by the Council for Accreditation of Educator Preparation State Partnerships and Content Areas Committee.

(henceforth, e-portfolios) can be accessed to all stakeholders involved in teacher education, including preservice teachers, teacher-trainers, mentors, and potential employers. This paper examines whether the technology-enhanced teaching portfolio application will enable preservice teachers to advance academically and professionally. The following sections provide a general review of teaching portfolios and describe the methodology of the present pilot study. The findings of the study will be presented along with suggestions proposed for its application in Chinese-language teacher education.

2. Teaching Portfolios: a Literature Review

The concept of using portfolios in teaching and teacher education dates back to the 1980s, and it has now become common in teacher education programs in the US (e.g., Worf, 1996; Worf and Dietz, 1998; Zeichner and Wray, 2000; Zeichner and Wray, 2001; Foote and Vermette, 2013). According to Bal (2012), a portfolio is a collection of a learner's work over a specific period, showcasing his or her knowledge and development through different stages of education and training. The items in the compilation reveal the learner's development and achievements, as well as experience, reflections, and self-evaluation represented either by his or her own writings or by artifacts. Portfolio applications offer the potential to document each student's journey of learning thereby serving as an effective tool for individual learning (e.g., Imhof and Picard, 2009; Gibson and Barrett, 2002). The core of the portfolio is the systematic evaluation of the learner's performance and work as argued by Moya and O'Malley (1994). Barrett (2011) emphasized that the real value of portfolios is its capability to promote students' reflection and learning.

Portfolios used to be collections of work assembled in "boxes" or "three-ring binders," but a new container emerged with the advent of information technology, resulting in what is known as e-portfolios, "stored in digital form" (Gibson and Barrett, 2002, p. 556).³ According to Gibson and Barrett (2002), e-portfolios can be created by using generic and/or customized tools such as HTML editors, multimedia authoring software, programming, and databases. Regardless of the format, paper-based or web-based, portfolios have become an established practice to achieve different purposes. Bal (2012) claimed that portfolios serve as "an essential evaluation tool revealing descriptive, formative and summative information about students and their products, as well as suggesting the information about students' strengths and weaknesses in line with the organization of the education" (p. 88). McColgan and Blackwood (2009) pointed out that portfolios fulfill two functions: encouraging students to engage in producing evidence of their competency and personal development, and providing employers with a tool to evaluate their staffs. Tucker et al. (2002) suggested that portfolios have a dual-goal: evaluating and developing professionalism with the two complementing each other. Wolf and Dietz (1998), however, proposed a three-fold model based on the authorship of the

³ Kilbane and Milman (2003) noted that terms such as "digital portfolios," "multimedia portfolios," "e-portfolios," "webfolios," "electronically-augmented portfolios," all contain the same basic content as traditional teaching portfolios, but presented in digital format.

portfolio, and the roles that the portfolio can play.⁴ That is, a *learning portfolio* created by preservice teachers for self-assessment; an *assessment portfolio* developed by in-service teachers for their professional growth; and an *employment portfolio* presented by individuals to prospective employers for career development. Therefore, the function of portfolio can span a student teacher's entire academic career from the initial training to the final job search.

There has been a myriad of research on portfolios and e-portfolios since the concept was incorporated into teacher education. A review of the related literature shows various studies on different aspects. Many explored their benefits, including student learning (e.g., Zou, 2003), quality teaching (e.g., Kim and Yazdian, 2014), or assessment (e.g., Fasanella, 2002; Price, 2013). Several specifically looked at training teacher candidates in separate disciplines, such as mathematics (e.g., BAL, 2012), physics (e.g., Ogan-Bekiroglu, 2014), ESL (e.g., Kim and Yazdian, 2014), and foreign language learning (e.g., Demirel and Duman, 2015). Certain research examined their use in the K-12 education (e.g., Kim and Yazdian, 2014), while others focused on higher education (e.g., McColgan and Blackwood, 2009). There are also studies about development of electronic portfolios for Distance English Language Teachers (e.g., Kecik et al, 2012). More relevant to this paper is the research that examined preservice teachers' perceptions, as summarized below.

Cakir and Balcikanli's (2012) is a study of the perspectives of English Language Teaching student teachers and teacher trainers on the use of the portfolio in preservice language teacher education. The results suggested that both student teachers and teacher trainers found that portfolios were beneficial in reflection, self-assessment and awareness. Based on their findings, the authors proposed integrating the European Portfolio for Student Teachers of Languages as part of teacher education program, and further converting it into an online format to make it more convenient for the student teachers. In the same vein, Kecik et al. (2012) conducted a survey of the needs of preservice teachers and determined whether the portfolios satisfied the needs in distance teaching practice courses. Comparing and analyzing the quantitative and qualitative data from university supervisors, teacher candidates, and cooperating teachers on the feasibility of the e-portfolio application, they found that all the three groups agreed about the needs of preservice teachers. While there were some minor variances in the perspectives of each group, they found that e-portfolio application can meet the majority of the planning, teaching, and reflection needs in the teaching process. Ogan-Bekiroglu (2014) measured preservice teachers' reflections using a targeted qualitative research, i.e., participants' portfolios and interviews. The findings showed that most of the preservice teachers gained expertise in reflecting upon their teaching skills. In another study, Bal (2012) showed that primary mathematics teacher candidates enhanced their thinking and researching skills and improved their cognitive and affective processes. The study also showed that students who are academically more successful also gained more effective research skills.

⁴ Bullock and Hawk (2001) distinguished three types of portfolios: Process, Produce, and Showcase. Regarding the purposes of portfolios, they include five sub-types: portfolios for preservice teachers; for obtaining a job; for continuing licensure; for alternative evaluation; and for master teachers.

While studies on the portfolio abound in the literature, suggesting positive and beneficial effects on preservice teachers' skill development, scant efforts have been made to uncover the effects of utilizing portfolios in a Chinese-language teacher preparation program in order to evaluate students' academic and personal development.⁵ As a result, this study describes a teacher educator's efforts to integrate an e-portfolio project in a graduate-level teacher curriculum with the goal of gaining insights for improving Chinese-language teacher education.

The major research question of this study is: whether the e-portfolio development serves as a learning tool as well as a means of assessment for Chinese teacher education. In addition, it explores the specific question whether applying the technology to portfolio construction adds value. The research questions are outlined below:

1. Does using e-portfolio contribute to preservice Chinese teachers' skill development?
 - 1.1 Do preservice teachers develop their teaching philosophy through using e-portfolio?
 - 1.2 Do preservice teachers develop a professional resume through using e-portfolio?
 - 1.3 Do preservice teachers develop quality lesson plans through using e-portfolio?
 - 1.4 Do preservice teachers develop a professional e-portfolio?
2. Does technology add more value to the e-portfolio construction?

The author hypothesizes that building e-portfolios is a dynamic learning process towards the learning objectives, while the end product provides evidence for evaluating student learning. As preservice teachers develop the content of their portfolios, they learn to formulate teaching beliefs, design instructional activities, create lesson plans, and prepare teaching demonstration. All of these contribute to the cultivation of competence, knowledge, critical thinking, reflections, experience, skills, and professionalism required for a qualified Chinese-language teacher (ACTFL, 2002; Everson, 2009).

3. Methodology

Participants The ten graduate students participating in the current study were enrolled in the teaching track of Asian Studies graduate program, who were undergoing training to become Chinese teachers in the K-12 setting in the US. Three students were at their 4th semester, ready to graduate by the end of that semester, while other seven students had been studying for either one year or one year and a half in the program. All except one had completed *Methods of Teaching Chinese* before they undertook the project. All of them had some experience tutoring or teaching American students as a guest teacher or a student teacher. Some were working part-time in private schools or weekend heritage Chinese schools. It is worth mentioning that of the ten students, six had

⁵ Teachers College at Columbia University required their students of the Teaching Chinese to Speakers of Other Languages Certificate Program to produce e-portfolios, <http://www.tc.columbia.edu/arts-and-humanities/tcsol-certificate/resources/e-portfolios/>. However, no publication was found on this topic.

either completed one-year study in the graduate program Teaching Chinese to Speakers of Other Languages at a Chinese university in China or had already earned an MA degree from that program. Demographically, one was from Taiwan, nine from mainland China, with two male students and eight female students, ranging from mid 20s to high 30s in age.

Context All the participants registered in *Supervised Teaching of Chinese*. This was a graduate course specially designed to help preservice teachers acquire skills and techniques required to teach Chinese language and culture. Foreign language education standards (ACTFL, 2006) were re-visited and major principles of second language acquisition (e.g., Lee and VanPatten, 2003; Lightbown and Spada, 2013) were re-examined in the class. However, the focus of the course was to cultivate preservice teachers' ability to apply standards to teaching, gaining a better understanding of the requirements, and developing teaching skills. To that end, students were required to explore teaching of the Chinese language in a real-world setting; this required that they teach at a self-selected school for at least a month or co-teach 4 to 6 classes under the supervision of the instructor in conjunction with their mentors in the school. For each class, students needed to hand in a lesson plan, including the objectives to be achieved, the materials to be taught, the methods or techniques to be applied, and the activities to be used. Apart from that, students were required to observe classes and to compile five journals that recorded their experiences. Each journal had to include their reflections about the lesson plans of the instructor, teaching methods, student reactions, student performance, and any other relevant issues if observed. Participants also needed to design five teaching activities for teaching some aspect of the Chinese language or culture. Finally, students needed to submit a paper reflecting on what they learned throughout the course. All the above, i.e., the teaching, journal writing, activities designing, and reflective paper, were purposely assigned to prepare the preservice teachers to build their own portfolios. Classroom discussions were planned throughout the course. Taking teaching philosophy, for example, students were first shown a sample, which was then discussed and analyzed in the classroom to identify important elements for a good teaching statement. Students also watched videos of teaching demonstrations to learn to develop a lesson plan, teaching activity or task with a focus on the strengths and weaknesses of each class. Throughout the project, assistance and support was available from the instructor or the mentors of the school where students were teaching.

Implementation of e-portfolios To determine the role that the e-portfolio application plays in preservice teachers' learning journey, each preservice teacher was assigned to create an online profile, which was to contain a minimum of the following: resume, introduction to oneself, teaching philosophy, lesson plans, instructional activities, video-taped teaching demonstrations, and student work. The e-portfolio creation was a required project assigned on the first day of the course *Supervised Teaching of Chinese*. The completed portfolios were evaluated based on a rubric developed by the author, also the instructor of the course, as presented in Appendix.

Technology What is the best tool that will enable preservice teachers to create their portfolio and make it digitally accessible? ⁶ After consultation with experts from the Teaching, Learning and Technology Center (TLTC) of the University where the author teaches, *WordPress.com* (henceforth *WordPress*), the most popular online publishing platform was selected. ⁷ Powering 27% of the internet, *WordPress* provides the ability to build a website free of charge. ⁸ The second rationale for choosing *WordPress* is its flexibility, enabling one to build a blog, a full website, or a combo, or a portfolio, or a business site. The third reason was that *WordPress* offers professional-looking templates but allows for individual customization. The fourth reason for selecting the tool to host the preservice teachers' portfolios is that the platform provides universal access to any interested party on any possible devices, including mobile phones.

While *WordPress* "is the easiest place to get started," as boasted by *WordPress.com*, it still presents difficulty to new users who have little technical knowledge or skills (e.g., Avila et al, 2016). Aware of the challenges to get started with the system, and the complexity to build an e-portfolio (e.g., Kilbane and Milman, 2003), we invited a senior instructional designer from the TLTC to the class to lecture on the fundamentals of developing a website as well as using *WordPress*. Not only did the instructional designer show the class how to create a website from scratch, she also offered advice on practical issues such as how to handle online media files. This training was arranged in the middle of the semester when preservice teachers had begun to assemble the content materials. Students had three weeks to focus on the development before submitting their first draft, i.e., a link to their website. Thus, sufficient time was guaranteed for each one to create the profile, to modify it after receiving feedback from the instructor or his or her peers, and to re-submit it following additional reviews and revisions.

Learning Objective The Graduate Program in Asian Studies where the author works has established, for assessment purposes, a learning objective for the student cohorts in the teaching track. According to this learning goal, preservice teachers are expected to become competent in teaching Chinese as a foreign language in the K-12 setting by the end of the program. The preservice teachers' e-portfolios were thus evaluated based on this learning goal using the aforementioned rubric. To be more specific, the competence was examined from four perspectives. They were (i) whether preservice teachers were able to develop their teaching philosophy; (ii) whether they

⁶ Two experiments were tried before this project. In the first trial, only one technology savvy student was able to set up her portfolios on a website. All others handed in either traditional binders containing all the materials, and artifacts, or a combination of printouts with CDs. With the built-in function on *Blackboard*, students in the second experiment were required to use *Blackboard* to host their profile. While students all completed the works, they could not share them with others. This is because the profiles on *Blackboard* can only be accessed by the students who created them.

⁷ As an open-source software, *WordPress* has two types of platforms: *WordPress.com* and *WordPress.org*. The former has both free and paid options, both running on the servers of *WordPress.com*, and the latter requires the user to download and install the *WordPress* software script on a local server. In other words, *WordPress.com* provides a service that enables one to get started relatively quickly, while *WordPress.org* requires more time and expertise to set up (e.g., Jones and Farrington, 2011; O'Neill, 2017).

⁸ Well-known name brands like NBC Sports, TED, CNN, TIME use *WordPress*.

could produce a professional resume and provide an appealing introduction about themselves; (iii) whether they could design solid lesson plans; and (iv) whether their website was complete, professional and user-friendly.

Measures Competence Based on the above four criteria, each e-portfolio was scored by the instructor as follows. First, if a student developed a profound teaching philosophy with deep thinking and reflections, the individual would receive a full score of 7.5 points. Second, if the student produced an updated resume with an introduction highlighting his or her credentials, experience, and skills, the individual was awarded a perfect score of 7.5 points. Third, if the student presented well-prepared lesson plans, engaging activities, and a teaching demonstration, he or she garnered a score of 7.5 points. Finally, additional 2.5 points were given if the website exhibited a professional look and was easy to navigate. Thus, a total of 25 points indicated “excellent” work, a score of 20 points was considered “good”, and 15 points was “fair.”

Measures Perceptions In order to find out the preservice teachers’ perceptions about the creation of the portfolio, we administered a survey after the project was completed. The survey consisted of four multiple-choice questions, and three open-ended questions. The first and second survey questions solicited preservice teachers’ thoughts about their own learning on the whole and their individual growth in particular. The third survey question requested preservice teachers to reflect on their achievements through the project. The fourth and seventh questions invited participants’ opinions on the difficulty of the e-portfolio development. The fifth and sixth question surveyed their views about the benefits of the e-portfolio application, and their use of the e-portfolios in job searches.

4. Results

Overall Results The scores of preservice teachers’ e-portfolios appear in Table 1. As can be seen, two of the ten participants achieved an excellent performance, and two were almost perfect (24.5 points), with one approaching the excellent (24 points). Four participants scored between excellent and good (achieving 21 and 22 points, respectively), and one received a good performance (20 points). This suggested that all the preservice teachers met the requirements.

Table 1: Scores of Preservice Teachers’ e-Portfolios

Areas Students	Teaching Philosophy	Professional Resume & Background	Lesson Plan & Activity	Navigation No Error	Total Points (25 points)
S1	7.5	7.5	7	2.5	24.5
S2	7	6.5	6.5	1.5	21
S3	7.5	7.5	7.5	1.5	24
S4	7.5	7.5	7.5	2.5	25
S5	7.5	7.5	7	2.5	24.5
S6	7	6.5	6.5	1.5	21
S7	7.5	7.5	7.5	2.5	25
S8	7.5	7.5	4.5	2.5	22

S9	7	6.5	7	1.5	22
S10	7	6	6	1.5	20

Student Learning Experience All the ten participants completed the survey. As the answers that students provided to the first and the fifth questions overlapped, we summarized their responses in Table 2. The left column of this table presents the six key phrases generated out of the commonalities of the students' writings with respect to their perceptions of the learning through the e-portfolio application, and of the benefits by such a project. The right column indicates how many participants had expressed that idea, who the participants were, along with sample quotes for illustration. As can be seen in Table 2, nine out of the ten participants explicitly remarked that they had learned how to build an e-portfolio in the form of a website. The know-how on website development represents advanced technology skills. As information, media and technology skills are a crucial part of a variety of skills set required for students of the 21st century (Partnership for 21st Century Learning, 2009), it is significant that preservice teachers acquire these skills and take advantage of technology throughout their careers. The remarks by S4, "... *The technology, which I learned helps me a lot for my current Chinese teaching*" indicates the student's satisfaction with the experience. It is also interesting to note that seven participants felt greatly benefited by the opportunity to promote themselves via the website, suggesting a progress in transforming from "modesty" (a virtue of traditional Chinese culture) to "expressive" (an attribute of an effective teacher). Furthermore, six participants noted the significance of reflection in the learning process. The following quotes, "*this project gives me an opportunity to let me think what I already did and what I should have done but I didn't in the past ...*" (S1), "*because I need to make the profile look abundant, I would push myself to ...record more teaching activities*" (S3), and "*Thinking more about how to become better Chinese teacher*" (S9), evidently demonstrated that these individuals had a clear goal in mind, and that they were constantly pursuing that objective.

From Table 2, we see that roughly half of the participants felt the project improved their understanding of the requirements of the teaching professional and English writing skills. Half of the participants found that the e-portfolios were useful for job searches. The four participants, S1, S3, S4, S5, who scored high in portfolio performance as shown in Table 1 felt they had made greater achievements. They were also the ones who reflected most about their progress. While S8 and S10 scored lower, both believed that they had advanced in different areas.

Table 2: Perceptions of Preservice Teachers on Learning and Viewpoints about Benefits

Preservice Teachers' Reflections	The Number of Preservice Teachers Who Had Similar Thoughts, with Sample Quotes
a. Building a website	9 Preservice Teachers: S1, S2, S4, S5, S6, S7, S8, S9, S10 , e.g., S1: " <i>I learned how to build a useful website</i> " S4: " <i>I learned some technology about building the personal website, which is useful for me... The technology, which I learned helps me a lot for my current Chinese teaching.</i> " S7: " <i>I have learnt the basic skill to create the e-portfolio</i> " S9: " <i>How to design my website</i> "
b. Promoting oneself	7 Preservice Teachers: S2, S3, S4, S5, S6 S8, S10 , e.g.,

	<p>S2: <i>“It is like a window which parents and employer could understand me deeply. Also, I could share my teaching inspiration and welcome to suggestions from my colleagues”</i></p> <p>S3: <i>“I learned how to promote myself and show my teaching experience and products which is very helpful for interview... it’s a great platform to demonstrate my teaching philosophy, teaching methods, activities, and students’ works.</i></p> <p>S5: <i>“that I can present the qualifications on what makes me a good language teacher.”</i></p> <p>S6: <i>“It’s an effective method to show my Chinese class directly. It’s a better way to show my resume directly and it’s also convenient for people who want to learn Chinese to check some course they really want.”</i></p> <p>S8: <i>“How to promote myself using website”</i></p>
c. Reflecting on learning	<p>6 Preservice Teachers: S1, S3, S4, S7, S8, S9, e.g.,</p> <p>S1: <i>“this project gives me an opportunity to let me think what I already did and what I should have done but I didn’t in the past as a Chinese language teacher or a student who want to be a Chinese language teacher....”</i></p> <p>S4: <i>“gave me an awareness of thinking how to show my teaching ability and my characters” ... “but also for myself to realize what I should do and how to do” “It gives me an opportunity to know more about myself and summarize the teaching material. I appreciate the feedback, and learned a lot from the other classmates. Without these, I may be stuck and cannot improve myself.”</i></p> <p>S8: <i>“It helped me review what I learned about teaching theory”</i></p> <p>S9: <i>“Thinking more about how to become better Chinese teacher.”</i></p>
d. Understanding requirements	<p>5 Preservice Teachers: S1, S4, S5, S9, S10, e.g.,</p> <p>S4: <i>“after I finished the project, I have a logical and clear understanding of my teaching target, what are the requirements of an effective Chinese teacher and my teaching philosophy”</i></p> <p>S9: <i>“Understanding the requirements of Chinese teacher ... Understanding more about the qualities of Chinese teacher”</i></p> <p>S10: <i>“Understanding the requirements”</i></p>
e. Improving English writing skills	<p>4 Preservice Teachers: S1, S2, S8, S9, e.g.,</p> <p>S1: <i>“...this project also improves my writing skills in English, since I have to write my resume, teaching philosophy and introductions of my teaching program in English.”</i></p> <p>S8: <i>“how to write teaching philosophy and introduction in an appropriate way.”</i></p> <p>S2: <i>“improving my English”</i></p>
f. Searching for jobs	<p>5 Preservice Teachers: S3, S4, S5, S7, S9, e.g.,</p> <p>S4: <i>“Above all, the e-portfolio helped me find a job and gave me a fully prepared interview.”</i></p> <p>S5: <i>“It is very helpful when looking for the job”</i></p> <p>S7: <i>“Useful when I search for job”</i></p>

In terms of the second survey question, *Did the project enable you to become a serious learner about the K-12 Chinese language teaching?*, all the participants answered YES, suggesting that the e-portfolio application has made them become more thoughtful about teaching Chinese in the K-12 setting. The third question, *During the process of developing your e-portfolio, did you achieve any progress in the following aspects?*, allowed each individual to select as many given statements as they believed best described their personal growth. The results of their choices are presented in Table 3. It is

clear from the table that almost all the participants thought that they had obtained a better understanding of requirements for Chinese-language teachers in the real world. Most of them became more committed to pursuing a Chinese teaching career in the K-12 setting. Again, many believed that they had improved English writing skills. Half of them felt that their sense of responsibility was raised, and their high-level critical and reflective thinking skills were improved as well. Four of the ten participants indicated that they had strived for professionalism. The self-evaluation from the preservice teachers as shown in Table 3 suggested that the experience enhanced their academic progress and personal growth. Those who scored high in terms of e-portfolio, i.e., S1, S3, S5, S7, had made significant progress, as shown by the selection of four aspects in Table 3. What is worth noting is that S9 seems to be a rising star among this group of preservice teachers. As this individual always reflected on how to be a better Chinese teacher, as in the comments, “*Thinking more about how to become better Chinese teacher*” mentioned above in Table 2, this individual felt he or she had progressed in as many as six areas. Again, the student, S10, who scored the lowest in Table 1, believed that he or she had made good progress in three areas.

Table 3: Perceptions of Preservice Teachers about Accomplishments Obtained

Statements of Six Accomplishments	Number of Preservice Teachers Selecting the Statement
a. Gained a better understanding of requirements for Chinese-language teachers in the real world	9: S1, S3, S4, S5, S6, S7, S8, S9, S10
b. Became more committed to, and serious about pursuing a teaching career in the K-12 setting	8: S2, S3, S4, S5, S6, S7, S8, S9
c. Improved high-level critical and reflective thinking skills about teaching and learning	5: S3, S5, S8, S9, S10
d. Increased the sense of responsibility	6: S1, S3, S4, S6, S7, S9
e. Improved English writing skills	7: S1, S2, S3, S6, S8, S9, S10
f. Strived for professionalism	4: S1, S5, S7, S9

Regarding the fourth survey question, *Is it difficult to complete the project?*, only two students commented about the difficulty, which will be discussed below when the seventh question is addressed. With respect to the sixth question, *Since you completed your website, have you ever used it for your job search*, seven students answered YES. Two mentioned that they used their websites as a sample in a STARTALK Teaching Training program, and received good feedback. This positive attitude toward their own e-portfolio was correlated with the perceptions that they provided when answering the fifth question regarding the benefits of the project.

For the seventh survey question that asked in what way the project was difficult, two students made comments. The student, S4, said, “*My answer to Question 4 is (b), but I remember that I need a lot of time. It is not difficult, but it needs time and patience.*” The other student, S10, expressed in Chinese, which was translated by the author as the following, “The portfolio requires many teaching plans and teaching materials, which

may not be difficult for those with teaching experience. It is very time-consuming as well as stressful for inexperienced students.”

5. Discussion and Conclusion

With respect to the primary research question, it was found the e-portfolio application contributed to Chinese-language teacher preparation in several areas and to varying degrees. First, Chinese preservice teachers gained a better understanding of the requirements for Chinese-language teachers. Secondly, they developed a greater commitment to a teaching career in the K-12 setting. Thirdly, they improved their level of critical and reflective thinking skills. Fourthly, they improved their English writing skills. Fifthly, they raised their sense of responsibility as a teacher. Finally, they became aware of the need to develop a sense of professionalism.

The successful creation of an e-portfolio and the students’ reflections on their experiences suggested that all the preservice teachers took the project seriously, and made good progress on an individual basis. It was observed that the opportunity of building an e-portfolio offered the potential to encourage students not only to work hard toward their learning objectives, but also helped them plan their learning journey. In order to complete the requirements of the portfolio, preservice teachers needed to establish learning goals, organize their self-regulated and self-directed learning, thereby building their autonomous learning (e.g., Gibson and Barrett, 2002; Cakir and Balcikanli, 2012). While they were developing their profiles, the preservice teachers constantly reflected upon the goal, the progress, and the challenge of their learning. The e-portfolio application provided a supportive context in which each individual was able to take responsibility for one’s own learning, i.e., controlling, monitoring and self-evaluating their progress. At the same time, they also had the freedom to discuss various issue with their peers, the instructor, and sometimes mentors, and receive feedback and support on a regular basis during the portfolio construction process. Such a learner-centered environment further facilitated learning autonomy, which would lead to teacher autonomy, an attribute necessary for teachers. When preservice teachers become autonomous learners, they help their future students to learn independently (e.g., Cakir and Balcikanli, 2012). The entire project stimulated learning and growth. Consequently, preservice teachers obtained a better appreciation of foreign language education standards and the qualifications necessary for teachers, formulated their own teaching style and personality, and developed their professionalism. The findings lend further support to the premise that developing portfolios enhances student learning, as discussed in the literature (e.g., Campbell et al., 2004; Imhof and Picard, 2009; Kecik et al., 2012). Our findings indicate that the participating students in the e-portfolio project raised competency and skills. We further believe that this experience reinforces preservice teachers’ dedication to lifelong learning (e.g., Frey, 2008).

The findings of this pilot study suggested that the creation of portfolios served as a method to evaluate the performance of each individual, and inform the instructor whether the students had achieved the goals, and in which areas the instructor should

further guide and coach the students. The data presented in Table 1 showed that all preservice teachers produced satisfactory work, with some exceeding expectations. As discussed before, even for those who did not achieve excellent scores, their self-evaluation in the post-project survey revealed that they had also made good progress in various areas. Being a process as well as a product, the e-portfolio fulfilled the formative and summative assessment roles (Middle States Commission on Higher Education, 2007). The process of developing e-portfolios satisfactorily offered continuing feedback not only to the instructor for adjusting and improving instruction quality, but also to the preservice teachers for self-monitoring and planning their learning. Such a formative assessment that informed and guided both parties proved to be constructive in the ongoing teaching and learning context. Because the preservice teachers took the entire ownership of the e-portfolio development, and they were informed in advance what they were expected to produce, the formative assessment practice was particularly helpful to them. When the e-portfolios were completed, the final learning outcomes enabled the instructor to evaluate each preservice teacher by reviewing his or her performance and comparing it against the standards or benchmarks (see Figure 1 for a screenshot of a partial sample of a preservice teacher's e-portfolio). The findings that the e-portfolio project was able to motivate and evaluate student learning simultaneously support the argument for the dual-goal of portfolios in education, as postulated by Zeichner and Wray (2001) and Tucker et al. (2002). Our results also align with the study by Struyven et al. (2014), who found that the e-portfolio had proven to be a useful instrument for evaluating as well as developing teacher competences.

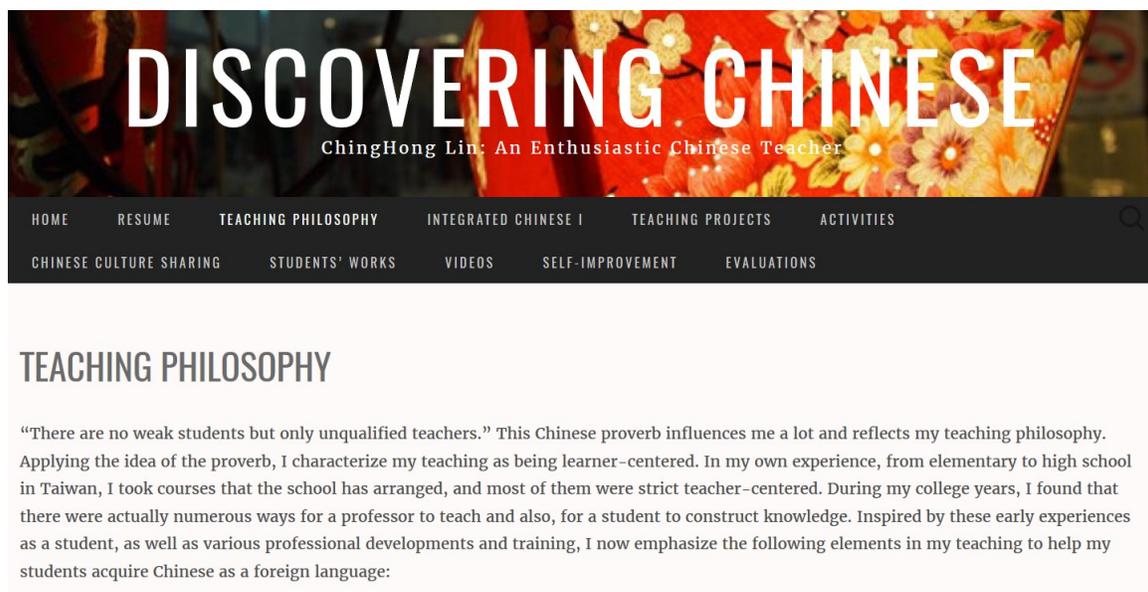


Figure 1. Screenshot of a partial sample of a preservice teacher's e-portfolio

With respect to the research question about the added value of technology associated with portfolio applications, some findings are particularly worth noting. First, the e-portfolio construction enabled all the participants to succeed in developing a professional-looking website, which advanced their multimedia and information technology skills in addition to their creative thinking and problem-solving skills. This

set of digital skills will be extremely helpful to preservice teachers when they educate their future tech-savvy students. These so called “digital natives” in the sense of Prensky (2001) may know more about technology than their teachers, yet some are not skilled enough to apply technology to advance their learning (Kuriscak and Luke, 2009). Some students may be strong with playing special technology, i.e., the technology that is involved in the programs especially designed for generating funs, but less experienced or motivated with utilizing technology for learning.⁹ In addition, the fact that the nature of e-portfolios — being accessible to anyone — pushed the preservice teachers to be conscientious about the process as well as the product. As compared with our previous two experiments with portfolio application, the enthusiasm of the preservice teachers, the quality of portfolios, the student learning experience and their final accomplishments for the current project were all superior to our past experiences. The preservice teachers expressed that they specifically benefited a great deal from the digital format of the portfolios. Many participants remarked on the value that technology added to their work. References to “*multi-media*,” as highlighted by the participant S9, and the comment by S6, who noted how e-portfolios can “*combine teacher’s resume with their Chinese courses together*,” illustrate the versatility of the technology used in creating e-portfolios. Knowing that their portfolios were to be posted online in the public domain, all the preservice teachers strived to make their profiles look as professional as possible. The participants reviewed and revised each item of content several times before uploading them so as to ensure that they were accurate and appropriate. For the participants for whom English was not their native language, such a process offered them an opportunity to improve their writing skills, which is absolutely necessary for a qualified Chinese-language teacher in the K-12 setting. Thirdly, *WordPress*, which provided flexibility in how materials could be organized, and displayed, helped the participants to think more logically when laying out their profiles, which helped expand web design skills, which, in turn, may further have fostered their critical thinking skills. This kind of experience is well captured in the following observation of a participant:

S4: ... *I have to summarize the teaching materials and then upload to the website. Before that, I did not sort of these materials ...This project made me [think] more clearly about what kind of the materials I need to use...*

Finally, unlike the paper-based portfolio which has to be mailed to potential employers, the e-profile is available online, and therefore easy to share with potential employers. The finding that the majority of the participants used their e-portfolio as part of their job searches represented another advantage, which emerged from this technology as illustrated by the following.

S5: “*The e-portfolio arranges all the information together which helps the interviewer find everything they want to know about a candidate. Compared with a normal paper resume, it actually shows the candidate in a teaching demo. This is important because the employer can see if the qualifications in the resume are reflected in the candidate’s demo. One of*

⁹ Hill and Cook (2011) noted that of the group of millennials, some are even “technophobes” (p. 37).

the interviewers told me that he was very impressed with my e-portfolio because he said that I clearly demonstrated my skills to him.”

Like any research, this study has its limitations. One major weakness is the small number of participants, and the fact that they came from one class. Thus, the findings may not be sufficiently representative of large student cohorts. It would be ideal to explore the research questions with a larger and randomized sample. The second limitation is related to the following two concerns: were all the accomplishments as shown in Table 1, 2, and 3 attributed by the mere completion of the e-portfolios? could it be possible that the practicum experience also contributed to the learning progress? It is difficult to tease out the practicum experience or exclude other factors. However, it is clear that it was through engaging this project that the preservice teachers were encouraged to participate in practicum training which, in turn, resulted in the enhancement of their learning. In addition, while the study has lent further support in validating *WordPress* as a powerful platform for hosting portfolios, as reported in the existing literature, little was done on its effectiveness as a learning tool. In other words, the current study did not examine how the blogging feature embedded in *WordPress* could be utilized to enhance active learning.¹⁰ Scholars have studied the use of *WordPress* as a content management system (e.g., Jones and Farrington, 2011; Avila et al. 2016; O’Neill, 2017), yet the function of *WordPress* as a teaching and learning tool has received little attention. Therefore, research should be conducted to analyze the role of *WordPress* on facilitating preservice teachers’ learning through exchanges with the instructor and peers via its blogging and commenting mechanism. Along this line, the question of how online meaningful interactions and communications engage preservice teachers to learn and reflect as compared to in-class discussions and face-to-face coaching should be addressed. Also required would be the study comparing the benefits that the two different platforms, i.e., *WordPress.com* vs. *WordPress.org*, could contribute to both teaching and learning. The questions to be examined may include the following: which platform can better enable preservice teachers to communicate with one another effectively? How does the portability of *WordPress* on different devices facilitate teaching and learning? How does the capacity of *WordPress* to store materials in multimedia formats motivate preservice teachers to think and reflect about the materials that they have learned? It should also be noted that new software and new technologies may make the methodologies discussed herein obsolete.

Despite the limitations, in light of the findings from this pilot study, the preservice teachers’ reflections and accomplishments, we propose incorporating an e-portfolios construction in a Chinese-language teacher preparation program. E-portfolio development can be a part of the teacher education curriculum as an independent course or as a project for a given course. If it is implemented as a project, it would be ideal to start the project as soon as students enroll in the program, as proposed by Wolf and Dietz (1998) who advocated 3 phrases of e-portfolio. As the portfolio development is a time-consuming but important learning process, it is reasonable to engage the students in the process and product construction as early as possible. In so doing, preservice teachers

¹⁰The blogging feature was not selected when students set up the template for their website.

will be able to learn and grow academically and professionally from an earlier stage. Secondly, we suggest teacher programs develop a framework that specifies the content required in the portfolios (see Snyder et al., 1998 for an example of a framework). Teacher trainers should help preservice teachers to determine the content in accordance with various courses at different learning stages. For example, for a theory-oriented course such as Applied Linguistics, students can develop a presentation on how languages are acquired, what theories explain first language acquisition and second language learning. If it is a Teaching Methods course, preservice teachers can create and add lesson plans and teaching activities to their portfolios. Thirdly, teaching faculty should provide sufficient time for students to consult their instructors and peers for input. Teacher trainers must provide or obtain technical assistance as needed for students. In this way, students would be equipped to examine, hypothesize, and reflect upon what they have learned, and ultimately apply what they have learned. Implementing these recommendations will help assure that the portfolios will be of high quality and the students will fulfill their learning goals. Fourthly, faculty of the education program should collaborate with the mentors and administrators in the K-12 setting. As noted by Zeichner and Wray (2001), incorporating the assistance of the teachers from the K-12 setting into the portfolio development process will help preservice teachers to effectively reflect upon and evaluate their learning. Preservice teachers will learn from the experienced teachers in the real-world, while being able to network with the teaching community.

To conclude, this paper examines whether the e-portfolios development serves as a learning method as well as an assessment tool, and whether utilizing the element of technology to portfolio development adds further value. This project demonstrated that engaging preservice teachers in the development of portfolios can place them in a supportive contextualized position to start their learning journey, and advance academically and professionally. We have also shown that building portfolios digitally on an independent website via *WordPress* can cultivate preservice teachers' advanced multimedia and information technology, critical thinking, and creative skills. In terms of the journey of transformation, we found that preservice teachers make progress in six areas through the implementation of the e-portfolio. Although great effort was required to build their profiles, the development and completion of e-portfolios granted teacher candidates a unique and valuable opportunity to reflect upon their learning objectives, the course material, and their professional career development. By reflection and practice, the would-be teachers have come to understand and appreciate the professional requirements, teaching methods, and instructional skills. Our study indicates that the e-portfolio application represents a valuable addition to the curriculum of training Chinese teachers.

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Appendix: Rubric for Rating e-Portfolios

Criteria	Proficient 25	Acceptable 20	Needs Improvement 15	Unacceptable 0
Teaching Philosophy & Background Information 30%	The professional philosophy is clearly described with sufficient evidence to justify beliefs. A current resume is provided with reasonable professional goals.	The professional philosophy is clearly defined with some general justifications for beliefs. Current resume and general professional goals are provided.	The purpose of the philosophy is described. No justifications for beliefs have been included. Current resume and professional goal are unclear.	The professional philosophy is unclear. Resume is not up to date or is generic in nature, educational philosophy and professional goals are not provided.
Teaching & Evaluation 30%	Student teaches at a school for a period of required time, which exceeds the requirements, and performs very well, with an excellent evaluation from the mentor.	Student teaches at a school, with some time, performs well, and receives a satisfactory evaluation from the mentor.	Student teaches at a school with inadequate time, with an ok performance. The evaluation from the mentor is barely satisfactory.	Student teaches at a school for a limited time; did not receive an evaluation from the mentor.
Lesson Plans & Teaching	Students prepares 5 lessons plans, each containing clear	Students prepares 5 lesson plans, each containing objectives,	Students prepares 5 lesson plans, with some objectives, focused	Students did not prepare 5 lesson plans, with no

Activity 30%	objectives, focused content, detailed procedures, and engaging material.	content, procedures, and good material.	content to some extent. Some procedures are not clear. Some material is good.	objectives or content, or detailed procedures.
Navigation Professional Look with No Errors 10%	The portfolio is easy to navigate, with a user-friendly professional structure, which reflects extra components and exceeds normal expectations. Errors or typos are eliminated.	The portfolio is easy to navigate, with a structure that satisfies expectations, includes required components, and is representative of professional work. Errors or typos are almost eliminated	The portfolio lacks required components, weak in components illustrated, unprofessional presentation techniques utilized. Some errors or typos are found.	The portfolio is incomplete in required and selected components, incorporates unprofessional presentation techniques, demonstrates inferior work, and is unacceptable. There are many errors or typos.
Overall Rating	Excellent	Good	Fair	Poor

Preservice Teacher Training for Online Chinese Teaching: A Case of Distance Courses for High School Learners (華語線上教師之職前培訓: 針對美國高中遠距華語課程之個案)

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Abstract: With the advancement of Internet technology, using videoconferencing becomes a feasible approach for teaching Chinese language courses online. This approach is especially beneficial to foreign-language learners who are typically lacking opportunities to freely communicate with native speakers. In order to meet the demands of such learners, a collaborative project between a high school in Hawaii and a collegiate research team in Taiwan was initiated in 2014. A group of well-trained graduate students served as synchronized online Chinese tutors for Chinese language classes at the high school. The online language-learning course is designed for enhancing both the native Chinese teachers' instructional guidance and enriching the target students' learning environments. For such distance courses, many factors should be taken into consideration, including pedagogies, online materials, students grouping, technical support and teacher/tutor training. Since teachers are involved in the above dimensions, teachers' professional cultivation, as well as teacher training process, is essential to successful implementation of distance courses. To enhance the teacher fostering efficiency, a process that consists five stages including pre-service courses, video clips review, class observation, teaching practice, and adjustment was applied.

摘要: 隨著網路科技的進步, 透過即時視訊會議來進行華語教學成為一項可行的門徑, 尤其可惠及那些缺乏與中文母語者交談機會的學生。為了迎合此類學生的需求, 自 2014 起由美國夏威夷某高中與台灣某大學的研究團隊共同展開了華語遠距教學合作項目。同步線上授課教師是一群經過正規華語教學訓練的研究生擔任, 此課程一方面是讓研究生提升其教學技能, 另一方面也使這所高中的學習環境更形開擴。對於這類遠距課程而言, 許多因素需要納入考慮, 包括遠距教學法、線上學習材料、技術支援及教師培訓。由於教師本身即是這些因素的執行者, 教師專業栽培及培訓過程是成功的關鍵因素, 為了提升教師培育

的成效，研究團隊規劃了一套流程，包括了職前課程、錄像覽評、觀課旁聽、教學練習及教學調整等五個步驟。

Keywords: teacher training, Chinese teaching, distance education, video conferencing

關鍵詞: 教師培訓、華語教學、遠距教學、視訊會議

1. Introduction

The paper will first introduce the background of the cross-country collaboration for the distance teaching, and then introduce the theoretical foci and the model for teacher training program. The results and the issues regarding the implementation will be discussed.

The purpose of the paper is fourfold: 1) To present a real case of collaborative distance learning for high school Chinese language courses, including course arrangements and teacher training; 2) To highlight the core of online teacher training, including the theoretical foci and the training content. 3) To introduce the CROPA Model we developed and applied for the teacher training process and stages; 4) To discuss the results of the implementation and feasibility of conducting the cross-country collaboration of Chinese distance teaching.

Teacher training of Chinese as a second language has been implemented for more than 50 years in Taiwan (Chen & Hsin, 2010). However, a variety of teacher training is designed for regular classroom teacher, rather than for teachers in innovative teaching environment, such as distance education through videoconferencing or via computer platform. Therefore, it is essential to develop a teacher-training program especially for online courses.

The earliest cross-country's Chinese distance teaching program in the world was implemented in 1996 as a collaborated project between the National Foreign Language Resource Center (NFLRC) in University of Hawaii and a research team in the Graduate Institute of Teaching Chinese as a Second Language at National Taiwan Normal University (Hsin, 1997). Along with the interactive webpage designed by NFLRC, synchronized webcam was also applied for voice communication. Following the rapid improvement of internet technology, more synchronized Chinese distance teaching projects have been executed for college level with this research team (Hsin, 2008; Hsin 2012). Later on, it was expanded to high-school level as a project involved five high schools located in different states in the U.S. (Hsin, Wang & Huang, 2014). Unlike non-synchronized web teaching, the synchronized distant teaching is heavenly relying on online teachers' operation and manipulation, especially for learners at high-school level, thus teacher training should be the most important element for such program.

By conducting research on the practice of distant Chinese teaching through synchronized videoconferencing platform, a research team called "Videoconferencing Chinese Language Team" (VC Chinese Team) was formed with professors and graduate students. The team established collaboration with a high school in Hawaii as the partner for the distant Chinese teaching project. A series of Chinese language classes were regularly offered by the research team in Spring semesters from 2014 to 2017. To facilitate the online course, a group of graduate students in Taiwan were trained by passing through a fostering process in order to serve as synchronized online Chinese teachers/tutors for the students of the senior high school.

2. Collaboration and teacher training

The technological advancement that led to the increasing popularity and accessibility of the Internet and Internet-based technologies is also changing the K-12 education rapidly (Barbour, Archambault, & DiPietro, 2013). Lin and Warschauer (2015) concluded that the rapid growth of online learning has given K-12 students' greater access to academic courses than ever before. There has also been increasing attention paid on what constitutes a quality online course. The understanding of what is required to be an effective online teacher and how to design an online course has deepened significantly (Menchaca & Bekele, 2008; Dawson, Dana, Wolkenhaur, & Krell, 2013). With the trend of technology-enhanced learning and the needs of Chinese language courses in American high school, the researchers initialed the collaboration project:

2.1 Overseas cooperation with the training course

Content for the distance-learning course mainly focused on supplementing the formal Chinese language course already underway at the high school. The distance online course, as an additional but required course, offers students an opportunity to experience real-time communication with native speakers on topics additional to their regular classroom curriculum to enhance their oral proficiency skills.

This online course has been offered primarily in the second semester of the school year. For example, in Spring, 2017, the session ran from February to May, with 8 lessons taught altogether; there were two back-to-back classes, fifty minutes per class. In each class, students were split into eight "small classes," with four to five students to one teacher online. Teachers were selected from amongst the best trainees depending on their performance on the pre-service training courses. This online course has received warm and positive feedback since 2014.

In Spring, 2017, the two classes involved were two different levels of Chinese: Chinese Level 2 Honors class and Chinese level 4 Regular class, offering the teacher trainees a wider range of students' age and proficiency levels. In the eight lessons taught, four to five students work with one teacher, with altogether 10 teachers and 34 students participating.

Upon completion of the course, preservice teachers were offered real opportunities for teaching under cooperation with schools overseas. Teachers were selected from the recently graduated trainees of the training program in previous year. All of them received professional training, and were able to successfully use digital resources and pedagogical skills in order to elevate the efficacy of their teaching.

2.2 Mandarin Chinese taught in the high school

Being one of the largest and oldest independent (private) schools in the United States, this school has been offering Mandarin Chinese as one of the five world languages in the Academy (grades 9-12) since 1976. Five levels of Mandarin Chinese are designed for students, with levels 1-2 corresponding to novice-level, levels 3-4 intermediate-level, and level 5 intermediate-advanced levels focusing on the Advanced Placement (AP) test for high school students. In the 2014-2015 school year, 283 students were enrolled in the Academy's Chinese program, accounting for almost one third of the high school students taking Chinese in Hawaii, including both public and private schools.

2.3 Implementing teleconferencing in Chinese 2 Honor Classes (H2) at the high school

Based on the lessons developed by the team since 2014, and the pilot lessons given to the co-investigator's Chinese 1 class in 2015, the co-investigator decided to explore the possibility of arranging her two sections of Chinese 2 Honor Class (2H) in the last two hours of the class schedule (in the Academy), so that teleconferencing with Taiwan would be much easier due to the time difference (i.e., 1:30 pm Hawaii Time to 7:30 am Taiwan Time; or 2:30 pm Hawaii Time to 8:30 am Taiwan Time). Drawing a lesson from the experiences of Chinese 1 in 2015, Chinese teachers in the high school realized that the school wireless server was at times unreliable, and hence influenced the learning quality. Therefore, rearrangement of the school Internet bandwidth during the two hours of teleconferencing becomes an essential task. The graduate students being trained as Chinese language teachers utilized Adobe Connect in the four chat rooms, which are interconnected with the high school's Chinese learning class. Each class was split into four small groups ("classrooms") of approximately every 5 students with one teacher. The materials used were based on a series of lessons created and designed by the research team, guiding the students beyond the scope of the regular textbook-based Chinese 2 Honor Curriculum.

In the teleconferencing session, students had access to native Chinese speakers other than their own teacher in Hawaii, with whom they polished their language skills (primarily listening and speaking) with guided practice of vocabulary and grammar. They also learned Chinese culture and society with the teacher in Hawaii. The topics covered are oriented to real life and contemporary issues. Popular cultural elements in Taiwan were highlighted, divergent topics, such as foods, snacks, regional cuisines, famous landmarks, tourist sites, TV programs, Chinese movies and celebrities, sounds and sights of the city are included. Each lesson is 45-50 minutes long and a survey was given right after each session for better understanding the student's learning outcomes

(e.g., retention of information) and general feedbacks. The teacher's major responsibility during the lessons was to troubleshoot the technical issues and observe the interaction between the student and the online teachers, so that she could give students suggestions and provide the online teachers in Taiwan with timely feedback to optimize the long-distance learning effect for both teachers and students. After two "pilot" lessons were given in the first semester of Chinese 2 H with very positive student feedback, 10 more teleconferencing lessons were completed in the second semester, with 12 student surveys conducted.

3. The insight of online teacher training

3.1 The theoretical foci of the teacher-training program for distance teaching

The characteristics of distance learning are very different from those of the traditional pedagogies, such as the unique forms of student-teacher interaction and media selected for pedagogical effectiveness. Idiosyncrasies are also found between different formats of distance learning. Previous studies have indicated that the professional competence of a distance teacher includes not only proficient application of multimedia, but also several specific instructional skills (Stickler & Hampel, 2007). Cheng and Zhan (2012) indicates that the training of pre-service teachers should focus on developing their abilities to apply technology tools into instructional design, which should be one of the important goals in applying technology. Therefore, there is a need to develop a distance learning teacher-training course. In 2016, the research team held the Chinese Language Distance Teacher Training Program (hereinafter referred to as the "training program"), operated with the goal of producing professional distance teachers of Chinese as a second language. The training focuses on the following four facets:

Table 1: Foci of the Training Program

Facet	Foci
Cognitive training	<ol style="list-style-type: none"> 1. To understand the objectives and structure of the training program. 2. To understand the roles and positioning of distance pedagogy. 3. To understand the current situation regarding Chinese as a second language education.
Pedagogical skills	<ol style="list-style-type: none"> 1. To write teaching plans according to the particularities of distance learning. 2. To design question-and-answer and discussion activities suitable for distance learning. 3. To utilize multimedia online pedagogical resources.
Theoretical knowledge	<ol style="list-style-type: none"> 1. To grasp the special features associated with distance learning. 2. To grasp the features of cross-cultural communication. 3. To adjust and revise teaching methodology according to evaluation results.
Media application	<ol style="list-style-type: none"> 1. To master the operation of pedagogical software. 2. To troubleshoot software and hardware problems.

3. To optimize the usage of supplementary resources and backup platforms.

On the basis of literature regarding teacher-training courses, the training program in this study adopts the following four teacher training methods, including reflection, microteaching, cooperative learning, and coaching:

A. Reflection

Reflection is a strategy frequently applied in the teacher-training model, which integrates the *received knowledge* of the applied science model and the *experience knowledge* of the craft model alongside the constant cycle of verification arising from the *reflective process*. *Received knowledge* refers to scientific knowledge of facts, data, and theory, including professional terminology, concepts, theory, skills, etc., while *experience knowledge* refers to the knowledge-in-action acquired by educators in the actual process of teaching. The *reflective process* takes the development of *experience knowledge* as a definite perceptive ability, allowing educators to make frequent reflections on personal performance throughout the teaching process. This further enables decision-making on how to replicate successful experiences in further teaching situations, while avoiding the reoccurrence of mistakes (Wallace, 1991).

B. Microteaching

Microteaching is defined as a fine and detail-focused training model, emphasizing repeated practice of simulated teaching situations in which pedagogical task, duration, and scope are all compressed in order to focus on one single pedagogical skill at a time. Execution time falls between five and ten minutes, with students numbering between three to five. Microteaching can be split into four stages: briefing, teaching, critique, and re-teaching. It is helpful in allowing trainees to self-identify insufficiencies, expose themselves to repeated practice and evaluation, and eventually master the pedagogical skill at hand (Wallace, 1991).

C. Cooperative learning

Cooperative learning is a form of small-group learning, requiring group members to cooperatively complete tasks based on structured, systematic teaching strategies (Cooper & Mueck, 1990). Cooperative learning includes communication between group members, task completion, self-study, strengthening of team efficiency, etc. It is helpful in accelerating learning achievement (Springer, Stanne, & Donovan, 1999).

D. Coaching

It refers to improvement of teaching strategies with the assistance of coaching partners or teams by means of reading, observation, demonstration, discussion, feedback, etc. Peers act as teachers for one another, not only improving pedagogical skills on the basis of feedback, but also helping to solve teaching dilemmas (Joyce & Showers, 1982).

The four aforementioned methods have all proved effective under the lens of prior research. The current research affects the methods in the context of a teacher-training program. It combines lecture with practicum, and utilizes the reflective model in order to maximize received and experience knowledge of the trainees as well as to accomplish the goal of fostering professional competence. The training program also integrates microteaching, cooperative learning, and coaching, making use of group and individual teaching practices, group teaching plan compilation, and discussion between teachers in order to increase opportunities for sharing and dialogue.

3.2 Human resources of the training program for the online curriculum

Human resource is the foundation of a successful training program. Those involved in the training program fall into the following five categories:

(1) Lecturers: Lecturers were responsible for imparting pedagogical knowledge and skills. They are specialized in fields such as question-and-answer strategies for distance learning, instructional skills, classroom management, operation of Adobe Connect, computer resources, etc.

(2) Seed teachers: Seed teachers were selected from amongst previous student participants, all of whom completed the training course with excellent records. All seed teachers have experience with distance learning. Their responsibilities included examining lesson plans compiled by students, offering suggestions for revision, observing and evaluating teaching demonstrations, and sharing personal experiences in distance learning throughout the duration of the class.

(3) Research assistants (4 persons): Research assistants assisted with work related to running the program. Their responsibilities included announcing course-related news, contacting lecturers, students, and seed teachers, responding to student messages, organizing weekly homework, recording classes, arranging groups and teaching practicums, conducting the training satisfaction survey and a post-training interview with students, creating files for all types of course information, etc.

(4) Technical staff: Technical staff was personnel recruited from the school computer center responsible for setting up the distance learning classroom, maintaining the distance learning platform, solving operational issues, and offering technology-related services.

(5) Teacher trainees: Teacher trainees enlisted prior to the start of the program, all of which underwent an evaluation of qualifications. They are undergraduate or graduate students in programs related to teaching Chinese as a second language.

3.3 Non-human resources of the training program for the online curriculum

The training program utilized various types of equipment. A brief outline of these resources is as follows:

(1) Multimedia material: The training program utilized a multimedia classroom with a computer and a projector, along with a computer room with individual PCs for use during the second week lesson on operation of the online teaching platform, and for the sixth week teaching demonstration observation and discussion session. Other supplementary resources included cloud storage, instant messaging, word processing, etc., which were used during the training program in order to assist in organizing course information, teaching material, homework, and questionnaires.

(2) Distance learning platform: The training program utilized Adobe Connect web conferencing software, including the following functions: (a) Video call: It transmits video information between students and teachers, simulating a face-to-face lesson. (b) Voice call: It transmits audio information between students and teachers, such that the two may interact through spoken language. (c) Electronic whiteboard: It displays slides used in class, instructions for classroom activities, course texts, teaching tasks, etc. (d) Instant messaging: It transmits text information between students and teachers; it may also be used for input of Chinese characters. In the case that there is an issue with the platform audio, it can also serve as an alternative mode of communication between students and teachers. (e) File upload: It transmits different types of teaching-related files, such as teaching material, slides, operational instructions, etc. (f) Participant management: It allows teachers to check on student attendance, as well as to manage the function of operation control for the platform. (g) Audiovisual recording: It allows teachers to record the class session. (h) Learning platform management: It offers all types of management functions, including setting class time, number of participants, recording, and record look-up, as well as managing advanced classroom settings.

(3) Language and culture teaching material: Two units on gift-giving and taboos were used as lesson topics for the two teaching practicum sessions, taken from the textbook entitled *The Life and Culture of Chinese Peoples*. Each of the two units is divided into four sections: study points, lesson text, vocabulary explanation, and discussion questions. Text content is related to Chinese culture, including explanations of vocabulary and cultural phenomena useful in facilitating student-teacher discussion on current cultural issues. By comparing Chinese culture with that of their mother country, students increased opportunity for practicing oral expression.

(4) Individual audiovisual equipment: Teacher trainees and students both provided their own webcams, headsets, etc. to use during the teaching practicum. Students and teachers were also situated in locations with reliable Internet connection during class time.

4. The process for teacher fostering

Koehler and Mishra (2005) proposed TPACK model that includes the interactions among three major components: Content Knowledge, Pedagogical Knowledge and Technological Knowledge. We designed our training primarily focusing on Pedagogical Knowledge, not Content Knowledge since these online teachers have

already possessed a high level of Content Knowledge, as they were graduate students majoring in teaching Chinese as a second language (TCSL). They had cultivated adequate knowledge and acquired experiences of TCSL through a rigorous curriculum of Chinese linguistics and Chinese pedagogy. Many of them had already had classroom teaching experience. Thus, the major focus of training was on strengthening their teaching skills on the videoconferencing platform with American high school students.

4.1 The CROPA Model: a five-stage model

The teacher training process we applied is based on five stages: Course, Review, Observation, Practice and Adjustments. We named it as *CROPA Model* as Stage 1: Courses of training for pre-service teachers; Stage 2: Review of sample video clips; Stage 3: Observation by sit-in Online Classes; Stage 4: Practice of Teaching in the real online classroom and Stage 5: Adjustment of pedagogy through feedback.

Stage 1: Pre-service training courses

The pre-service training course observed in this research was conducted throughout an eight-week period, starting in October and extending through December each year from 2014 to 2016, for a total of twenty hours. Face-to-face classes were scheduled for six of those weeks, with each class lasting three hours, for a total of eighteen hours. An additional two one-hour sessions for teaching practicum were scheduled between the fifth and six week as well as the sixth and eighth week. Class content matter was as follows.

Table 2: Class content of the Training Program

Class	Content	Participant	Time
Week 1	1. Introduction of the training program and distance learning	Lecturers	1 hour
	2. The first lecture on distance learning instructional skills, including video conferencing etiquette, principles for correcting mistakes, skills for asking questions, activity design, etc.	Lecturers	2 hours
Week 2	1. Introduction of video conferencing platforms used in teaching Chinese as a second language.	Lecturers	1 hour
	2. Operation of the online video conferencing platform: Adobe Connect.	Lecturers	1 hour
	3. Operation of the online video conferencing platform: Adobe Connect.	Lecturers	1 hour
Week 3	The second lecture on distance learning instructional skills, continuing with the content discussed in the first lecture.	Lecturers	3 hours
Week 4	Application of digital competency in language teaching, including teaching material design, question-and-answer practice, resource application, etc.	Lecturers	3 hours
Week 5	1. Discussion for sharing teaching experiences	Lecturers	2 hours

	and solving problems.		
	2. Online observation and evaluation.	Seed teachers	1 hour
Week 5-6	The first teaching demonstration with international students.	International students	1 hour
Week 6	1. Observation and evaluation of teaching demonstration videos.	Lecturers	2 hours
	2. Discussion of takeaways from teaching experience.	Seed teachers	1 hour
Week 6-8	The second teaching demonstration with international students.	International students	3 3 hour

Stage 2: Review of sample video clips

Tutors of these classes should review a series of video clips of distance teaching classes recorded during 2014 to 2016 in order to know the key dimensions of distance Chinese teaching, including pedagogies adopted by the former teachers, teaching materials in PPT format produced by the former teachers, the interactive situations and students actions on the online settings and so on. Along with self-review by the teachers, the project coordinators also selected certain example clips to analyze the merits and shortcomings about pedagogy and interaction for the teachers.

Stage 3: Observation by sitting in online classes

In this stage, these pre-service teachers were allowed to login into the online classroom (chat rooms of Adobe Connect platform) to observe the on-going classes. They joined the classes without turning on their own webcams, neither did they attend class activities.

In order to feel the atmosphere of synchronized online class, these pre-service teachers often simulated class teaching, observed the online teacher-students interaction, figured out how to responding to the questions proposed by the students, and proposed their comments and feedback to the teachers they observed.

Stage 4: Practice of Teaching in the real online classroom

After gaining the necessary knowledge, skills and knowing the class situation in previous stages, these pre-service teachers had been turned to be in-service teachers at this stage.

They were assigned to the certain classes one month before the beginning of their own classes. During the one-month preparation time, these teachers should be familiar with the background and Chinese proficiency level of the high school students, producing supplementary instructional materials, and making interactive PowerPoint materials.

In the beginning of their teaching sessions, every teacher should teach the class for 6-8 times, with one hour per time. These teachers should face the American students and execute the class teaching independently. They may encounter certain problems or difficulties in technique, chat room management and even English Q&A if students couldn't understand the course content in Chinese.

In the meantime, project coordinators in both research team and the high school will also login into the online classroom and observe the teaching. Although the coordinators do not provide instant help, coordinators will provide feedback for their teaching performance after every class meeting.

Stage 5: Adjustment of pedagogy through feedback

After each class, these teachers will be able to know their own teaching performances from several feedback sources:

1. They will receive evaluation from the high school students after each class meeting. Students should fill an evaluation form immediately after the class meeting with some questions as below:
 - a. What did you learn from this lesson? List all you can recall.
 - b. What did you find the most interesting in this lesson? Why? (Be as specific as you can).
 - c. What aspect of this online lesson did you find not so good or helpful, if any?
 - d. Do you think this lesson has provided you with authentic and useful information regarding the Chinese society and culture?
 - e. Do you think you were exposed to a genuine Chinese-speaking context through this lesson?
 - f. On a scale of 1-5 (with 1 being strongly disagree, and 5 being strongly agree), rate the statement: My online teacher is able to make all of us practice productively.
 - g. On a scale of 1-5 (with 1 being strongly disagree, and 5 being strongly agree), rate the statement: The materials used in this lesson are interesting and useful.
 - h. On a scale of 1-5 (with 1 being strongly disagree, and 5 being strongly agree), rate the statement: I find myself fully engaged.
 - i. If there is anything you could change for the next lesson, what would you like to see changed?

These online teachers can see the writing comments and the scores.

2. The coordinators in both research team and the school will provide their comments about the superiorities and weaknesses that should be corrected and improved.
3. In addition, online teachers should write the teaching journal after each class meeting. It's not only for indicating each student's performance and language ability, but recording the teaching process and introspecting their own performance.
4. Since we used the function of Sync Video to record each class, they can also watch the video clips to observe their own performance.

Since these feedbacks were always provided immediately after each class meeting, these online teachers can always adjust their own pedagogies or teaching materials for next class meetings. So it's a positive reinforcement cycle among teaching, feedback and adjustment along the whole semester.

5. Results of Implementation

Along the progress of the courses, we conducted evaluation by surveying students' comments and opinions from questionnaires week by week, including multiple choice and opened question items. In addition, during the class meeting, the coordinator in the high school was in the computer room to observe every group's learning process. After each class meeting, the coordinators in both sides provided suggestions and comments about the pedagogical skills of the online teachers of the project.

5.1 Students' major impressions

When responding to what intrigues them most, many students are impressed with the divergent online cultural exposures, close interactions with native-speaking Chinese teachers in Taiwan, uniqueness of Chinese language and the technical problems. Below are some examples:

A. Cultural exposure of Chinese:

- a. *"The most interesting thing I learned in this lesson was about the temples and the Chinese holidays. I also thought the online chat room aspect was super cool. "*
- b. *"I found it most interesting that our teacher compared the way we celebrate Christmas to the way...they celebrate the lunar new year (春節). My family celebrates both holidays and I never would've contrasted them.*

B. Uniqueness of Chinese language

"I found the phrase 念念不忘 the most interesting because I never thought that there would be an English translation for unforgettable. It was one of the most intriguing structures to me and I will definitely use it in the future. "

C. Merits of the online experiences

"I thought that it was interesting being able to learn from someone with a different perspective. It was like learning the same language in a new way. Being able to learn from someone currently in Taiwan made me feel more connected to the culture."

"I think that the most interesting thing about this lesson was the real life and relatable examples."

"We were also able to cover a lot in the short amount of time that we had. The lesson was very interactive with us being able to see each other."

5.2 Technical problems happened throughout the class meetings

While the computer technical problem (the poor connection sometimes) was regarded as the drawback of the online courses, most students felt satisfied with the online interaction.

"I couldn't really hear the teacher because I think we had audio problems but other than that, I liked it."

"I enjoyed doing the online session, but the audio was a bit low and sometimes it was hard to hear her and some of our classmates, especially when the other groups in our class were talking too."

"The only thing was that it was hard to hear her at times, but I liked everything she taught us!"

"I think everything was pretty good, but it was stressful because you are trying to understand things you've never really heard before (because it's a little more complex) and you're trying to make up things on the spot."

Despite of the Internet connection problems, students were very engaged in the online learning course, just like the way one student mentioned *"I felt that everything from this online lesson went extremely well I hope to continue these online lessons in the future as well."*

5.3 Authenticity

Most significantly, the majority of the students thought that the online Chinese learning courses could provide them with authentic and useful information regarding the Chinese society and culture.

"I thought talking to native people who spoke Chinese was interesting because I don't use Chinese when I talk to people at Chinatown".

"I felt that I understand more about typical weather in China, their typical modes of transportation, as well as their holidays such as Chinese New Year and that these Chinese students actually do not need to go to school at this time."

"I feel very authentic coming straight from a native speaker in Taiwan. She taught us not only the language, but of some cultural norms of the Chinese (i.e. the night market)"

"It was helpful learning about Chinese temples and how people pray, but my family has been doing that once or twice a year for a while so it wasn't a new concept for me. I think that the level of information was okay for the first time, since it is a new thing that was introduced just today."

However, several students expected that the teachers could increase more Chinese culture elements and go deeper. Because they *"got to learn from someone who is currently fully immersed in the Chinese culture. I wish we got to hear more about their culture and a little less about ours."* Therefore, the online course could be further adapted to meet the demand of individual differences in the near future.

5.4 The longing of closer interactions with teachers

"It was nice to have a lesson coming from a person that actually lives in a place where they speak that language."

"I found that the personal touch from having teachers who are living in china made the lesson more interesting."

"I loved how our laoshi was so patient, understanding, and smiling all the time. She could've been really stressed because we took a long time to answer her questions but she was smiling and trying to help us out."

Some suggestions are related to individual teacher's background. For example,

"Students feel more comfortable if they get to know their teachers a bit more -- so feel free to spend a bit more time talking about your life in Taiwan!"

5.5 Instructional adjustment needed

"Rotation among students can be faster at times, and if the teachers can be more spontaneous at times, the students will find it more interesting and less likely to idly waiting for their turn." (The high school's coordinator comments, March, 2017).

"The more the teachers can add in fun cultural facts, the more the students are interested. I think sometimes there are too much grammar/pattern practice/drills for them—more game ideas/jokes/fun facts can be incorporated." (The high school' coordinator comments, March, 2017).

5.6 Students survey summary

From the co-investigator's observations in the classroom and online, it is clear that the students were deeply engaged and very eager to participate in these teleconferencing lessons.

Based on the results of students' surveys, students are generally positive about the communication with native speakers from an authentic target language environment from which they could obtain better language skills and expanded their cultural experiences (i.e. acquisition of the 5Cs). Regardless of occasional connectivity lapses or breakdowns when using Adobe Connect, as well as some issues regarding teaching experience and styles, the majority of students found the lessons meaningful (e.g., they

have learned a "moderate or substantial amount") and "look forward to the next lesson". A summary of the results is given as follows:

Please rate the statement: I think lessons are worth having at this level

	Strongly Disagree	Disagree	N/A	Agree	Strongly agree
Frequencies	0	0	6	9	21
Percentages	0%	0%	16.7%	25%	58.3%

Please rate the statement: If I could choose, I would like to have online lessons such as these at other levels of Chinese

	Strongly Disagree	Disagree	N/A	Agree	Strongly agree
Frequencies	0	1	3	9	23
Percentages	0%	2.8%	8.3%	25%	63.9%

If you could have online lessons again at another level, what area(s) would you like the lessons to stress?

	Frequencies	Percentages
To strengthen conversation skill	30	83.3%
To better understand Chinese culture and society	23	63.9%
To practice grammar patterns and vocabulary	20	55.6
To get tutorial help from a native speaker	12	33.3
Other	5	13.9

The survey results after each online lesson confirm the value of doing these additional lessons. Moreover, in the last survey of year 2016, taken after the last teleconferencing lesson, 83.3% students responded strong agreement to the statement "These lessons are worth having at this level", while 89% would like to have similar online lessons at other level of Chinese. Most students found the lessons valuable in strengthening conversational skill (83%) and better understanding Chinese culture and society (64%).

6. Discussion and Conclusions

6.1 Implications

It is apparent that online interaction enriches the classroom experiences with more real life language learning environment in which the student gains hands-on experiences by practicing their language skills with native speakers, resulting in stronger learning motivation, deepening cultural understanding, and strengthening practical use of Chinese. A more arguably ideal arrangement, as several Chinese courses in this school have tried in the past, is to make online connections with native speakers of the same age (e.g., "e-pen pals" or videoconferencing with a class from an equivalent high school in China),

as peer language exchange appears more appealing and relevant to these high school students. But in reality it is not necessarily feasible or productive, since such exchanges are often subject to students' individual efforts and require careful planning, close guidance and collaboration between the teachers involved from both schools. Given the pressure of preparing students for performance-based tests as a central focus in Chinese high schools, the initial will to establish an ideal collaboration may soon evaporate after a few times of connection. What is more, long-distance connections are hard to sustain, especially for the novice-level classes, in which students have yet obtained the proficiency and skills needed to carry out prolonged meaningful language exchanges on a regular basis. What the co-investigator has learned from the 2H class's teleconferencing arrangement is that it is much more "sustainable" and mutually beneficial to work with a graduate program focusing on training young teachers, since the teachers involved tend to be highly motivated and more well-prepared to engage in productive sessions with the students, while the students receive from the native speakers linguistic and cultural benefits similar to what they would from peers at their own age.

The other valuable lesson from this collaboration is that the five Cs of ACTFL could be and even should be integrated into a novice-level curriculum. Other than communication, culture, comparison, connection and community should also be an integral part of the curriculum starting from the beginning (novice) level, which has been concentrated on the basic skill building (in terms of communication) in a conventional curriculum. The more understanding of culture, and comparison and connection between two different cultures, the more mutual understanding and self-confidence the student would have. This will in turn lead to a better global perspective for the student to cultivate intrinsic motivation to learn the Chinese language.

6.2 Further work needed

For the second-year novice level (2H), the co-investigator at the high school's Chinese program has yet developed a better approach other than teleconferencing with the native speakers or taking the students physically to visit a place in which the target language is used. Well-structured meetings and guided lessons helped shape a more authentic linguistic and social environment beyond the regular classroom, offering students a balanced acquisition of the 5Cs. The next step is exploring ways of expanding the students' learning experiences by augmenting their contacts with more native speakers with different vernaculars or even age groups, such as occasional connections with high school students and alternating contacts with different native-speaking teachers (preferably from different Chinese-speaking communities). It is also beneficial to build on the current model and extend the teleconferencing program to other levels of Chinese as well.

Moreover, it is expected that more authentic materials could be incorporated into the format and content of the teleconferencing lessons, making the lessons more hands-on and realistic by designing exposing students to different real-life situations for better practice of their language skills. By using recorded videos to incorporate the sights and sounds of a genuine linguistic context, the teacher could "take" the students onto virtual

"field trips" in which the students need to use their language skills to problem-solve (e.g., in a market place, on a high school campus, in a subway station, movie theater, etc.). After conveying some of these ideas in a conference with the research team, small experimental steps were taken to incorporate live sights and sounds, instead of just using lively PPT slides in their lesson design. In addition, students could also be assessed by projects simulating situations in a genuine target language context, e.g., helping an American tourist get transportation to see the Great Wall or traverse a Taipei Night Market. The implication for a well-designed online curriculum that balances the 5Cs in language education is that it will be tremendously instrumental in providing the student with a global perspective and a sense of reality beyond what a more traditional curriculum can do in the classroom.

6.3 Experiences we earned

The teleconferencing lessons designed by the research team serves as an invaluable platform for the novice-level students to obtain hands-on linguistic experiences and cultural knowledge from their online communication with native-speaking teachers. The Academy (grades 9-12) of school offers a rigorous Chinese program that consists of five levels, with equal emphasis of the four skills and the 5Cs in the forefront of the curricular designs. One of the challenges of a language curriculum is how learning could be extended beyond the regularly designed classroom, so that students could be situated in a more authentic language-learning environment to apply their skills with spontaneous communication. The widespread of technology at all levels of education at the high school makes it possible to connect the students with native-speaking environments where the target language is used in an inter-scholastic collaboration.

While such practice could be fruitful for the intermediate level, collaborations and pairing off students with similar age in videoconferences may not always be sustainable. The proficiency limitation of the novice-level students is the major challenge to develop regular mode of correspondence as a part of the curricular design. By way of regular long-distance lessons, the level 2 students' learning experience and skills are enhanced by their regular exposure to the values, social-cultural information and people in which the target language is actively used. Despite some areas of technological concerns and curricular adjustment that can be improved over time, the integration of teleconferencing lessons into a novice-level curriculum is undoubtedly a viable approach to enhance the cultural knowledge and the use of linguistic skills of the students taking a language course.

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