EDITED BY KO-YIN SUNG

TEACHING AND LEARNING CHINESE AS A SECOND OR FOREIGN LANGUAGE

Emerging Trends

Teaching and Learning Chinese as a Second or Foreign Language

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Edited by
Ko-Yin Sung

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Introduction to This Volume

Ko-Yin Sung

This edited volume consists of empirical or theoretical studies that address one of the three emerging themes in the field of Chinese language teaching and learning. The following sections explain the core themes of, and argue for the need of, research in each topic.

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

Since the 1960s, teachers and students have been incorporating some form of technology in learning and teaching a second language (Cok, 2016). In the twenty-first century, it would be difficult to imagine language learning or teaching without any technology assistance. Advanced technologies and information networks have altered the ways second languages can be taught, learned, and used. ICT increases the variety of opportunities for language learning and teaching with its feature of flexibility. It can take place in both formal and informal settings and occur at any time in any sociocultural context. For the learning of a less commonly taught language, such as Chinese, which is uncommon in most learners' immediate environments, ICT can serve as an important and effective tool in the second language acquisition process. The impact of ICT on Chinese language learning has been noted by many scholars such as Lin, Huang, and Chen (2015), who stated, "Technology integration has gradually gained prominence in CFL [Chinese as a foreign language] programs, since computers and the internet, being free of many time and location constraints, have proven to be highly convenient facilitators of CFL learning" (p. 1). The rapid advancements in technologies ask for a more interpretive and engaged pedagogy (Kramsch, 2014). However, the research

in ICT-supported Chinese language teaching and learning is still in the developing stage. A meta-analysis of thirty-seven scholastic papers published between 2005 and 2015 regarding ICT-supported Chinese language learning conducted by Cok illustrates that there is a limited number of ICT studies in Chinese language teaching and learning, and that most of the current studies introduce the ICT tools and document their use in language learning while the research on the effect and applicability of specific tools for specific language skills is lacking. In other words, studies which emphasize the methodological base of ICT use are still missing from the current literature. In order to lessen the gap in the existing studies, this volume includes studies which focus on how certain emerging ICT tools are methodologically applied in Chinese as a second or foreign language teaching and learning.

YOUNG LEARNERS

Stepping into the new millennium, China has become the world's fastest-growing major economy and the largest trading nation in the world. Mandarin Chinese, the official language of China, is now seen as one of the most important business languages for students to master, including young learners. Taking the United States as an example, parents and education and business leaders foresee the impact of China being a global economic power and have urged schools to include Chinese as a foreign language in K–12 curricula (Wang & Ruan, 2016). In addition, Hanban, a non-profit organization affiliated with the Chinese Ministry of Education, with the agenda to "make policies and development plans for promoting Chinese language internationally" (Confucius Institute Headquarters, 2017), has established hundreds of Confucius Institutes worldwide. The institutes not only offer Chinese language and culture courses and teacher training, but also provide K–16 schools with funding and personnel resources for Chinese as a second or foreign language education. Chinese officials view the institutes as a way to help spread Chinese culture and want to establish them worldwide as a propaganda strategy to increase their soft power around the globe (Seib, 2016).

Due to the aforementioned economic and political influences, the number of students of all ages, especially young learners, studying Chinese as a second or foreign language has been increasing in many parts of the world. For instance, Chinese is reported as becoming one of the two most commonly reported languages taught in U.S. dual language programs where students start studying Chinese and learning content areas through the Chinese language medium as early as kindergarten or first grade (U.S. Department of Education, 2015). A good example is in the state of Utah, where Chinese DLI programs have grown from zero to thirty three within the past six years.

The increase in Chinese language learners in the young age group is particularly unique as Chinese language had been taught as an academic subject outside Chinese-speaking communities to older learners in universities in the past few decades. Based on the findings in pedagogical psychology research, learner age is a crucial factor contributing to learner differences and styles (Wang, 2008). Earlier literature has pointed out that many learning characteristics of children and adults differ greatly including their psychological characteristics (Lenneberg, 1967; Penfield & Roberts, 1959), cognitive ability (Knowles, 1984; Lightbown & Spada, 1993; Piaget, 1955), attention span (Wang, 2008), memory (Hammerly, 1991), language processing (Harley, Howard, & Hart, 1995), self-consciousness (Krashen, 1982), and motivation for study (Gardner & Lambert, 1972). The different learning characteristics derived from the age difference require educators to apply age-appropriate teaching methods in the classrooms. Although the population of young learners of Chinese is increasing every year, the research into teaching Chinese as a second or foreign language to young learners, especially ones at kindergarten or elementary age, is lacking. Taking the research in the dual language field as an example, most of the current studies were conducted in the context of learning and teaching Spanish. It is urgent to start developing the literature in teaching young learners of Chinese as a second or foreign language as the Chinese language system is extremely distinctive from romance languages, such as Spanish and French, which are often the target languages examined in the current literature (see details regarding the Chinese language in the next section). The study results and their implications may not be applicable to teaching or learning Chinese. This book recognizes the importance of research into young learners and consists of studies which investigate young learners' motivations and effective methods in assisting them to master the Chinese language.

TEACHING AND LEARNING CHINESE CHARACTERS

The Chinese language, which has a conceptually distinctive orthographic system, compared to alphabetical languages, such as English, has many challenges for learners. The Chinese written language is composed of twenty-four basic strokes combined in different ways to form radicals, which are the basic components of characters. One challenge of learning Chinese characters is the amount of time and effort needed to remember the particular strokes and components. In addition, although the majority (90 percent) of Chinese characters consist of both semantic and phonetic radicals, which give readers hints to the characters' meanings and pronunciations, due to the evolution of the Chinese language, only 26 percent of the phonetic hints in modern characters

are identical to the sounds of the characters they represent (Feldman & Siok, 1999). The low correspondence between a character and its pronunciation adds another layer of difficulty in learning characters.

In addition to the significant differences in the orthographic systems between Chinese and alphabetical languages, the tonal feature of the pronunciation system of Chinese characters is also significantly distinctive. Every Chinese character is spoken as one syllable, which carries a tone. Identical syllables carrying different tones are linked with different characters, which differ in meaning. Moreover, it is common to find characters with different meanings carrying identical pronunciation and tone. For instance, one can find fourteen different characters with different meanings which share the pronunciation /li/ with the fourth tone (Wang, 1998). This means that in order to use the correct characters, learners need to have sufficient tonal and orthographic knowledge of characters. In order to be a literate individual in a Chinese-speaking community, knowledge of a minimum of 3,000 characters is needed (Wong et al., 2010). Due to the conceptually distinctive nature of the Chinese phonetic and orthographic systems compared to alphabetic language systems, learners of Chinese, especially those with an alphabetical language background, have to invest considerable time and effort before they could become a literate, functional member of a Chinese-speaking community.

Chinese as a second or foreign language researchers have been conducting studies to learn more about how learners of Chinese attempt to master character learning. For example, Wang (1998) used a survey to investigate beginning learners' strategies in learning characters and found that the learners frequently used flashcards, made glossary words, and hand wrote characters to memorize them. In contrast, Shen (2005) studied the strategies used by college learners of different Chinese levels and reported that they frequently focused on the learning of radical knowledge, graphemics, semantics, and phonetics, which are cues to encode characters. Shen's findings were similar to that of Ke's (1998) in which the learners reported focusing on character components and graphic structure. While many studies examined learners' methods in acquiring characters, only a few studies were conducted in experimental settings to compare the level of effectiveness of different learning methods. Jin (2006), for example, found that learners who were directed to pay attention to radicals performed better in a post–character recognition test than learners who were asked to focus on character stroke sequences or pronunciation. Taft and Chung (1999) reported that beginners who were asked to focus on learning radical knowledge while at the same time being taught new characters yielded better character recognition learning results than beginners who were assigned to study radical information before or after learning new characters.

A review of the current literature on Chinese character learning and teaching illustrates that there is a limited number of studies which help identify effective learning and teaching methods in character learning. In striving to look for effective ways for learners to bypass the tremendous difficulty in learning Chinese characters, this volume includes studies which intend to identify effective teaching and learning strategies to master the Chinese language.

HIGHLIGHTS OF THE CHAPTERS

The chapters in this book are written by well-respected scholars in the Chinese as a second language research field, whose studies provide in-depth analyses and offer readers updated and useful information in the field. The following paragraphs give readers a glimpse of the studies described in the chapters.

Chapter 1: Dali Tan, Angela Gunder, Shaoyu Chi, and Susan Picard describe their development of the eTower Project in this chapter, which offered online interactive language and culture lessons through seamless access, allowing students to learn from computers and mobile devices alike. At the end of the chapter, the researchers explain how the advanced technology tool was empowering the learning of Chinese language and culture.

Chapter 2: Yalun Zhou and Michael Wei investigate how the use of digital vocabulary games can promote learner autonomy in language learning and turn a traditional classroom into a multiplayer classroom. Through the analyses of multiple data sources, they elaborate on the reasons the new way of learning resulted in more engaged learning.

Chapter 3: In this chapter, Pei-ni Causarano utilizes learners' self-reflection as a tool in understanding their online Chinese language learning experience. She identifies interpersonal communication and reflectivity as two important keys to enhance online language teaching and learning.

Chapter 4: Yan Gao and I-Ping P. Fu explore the technology tool Teletandem as a possible effective approach to motivate Chinese language learning. Their study involved the collaboration of English-speaking U.S. students and Chinese-speaking students from Taiwan. Through Teletandem, the two groups of students were more capable of connecting and communicating in a transcultural online community.

Chapter 5: In this chapter, Chiara Romagnoli takes readers to the Chinese learning context in Italy. Her study investigated the motivations of Italian high school students and their thoughts regarding effective learning. A self-report questionnaire was used as the data collection method. The study found that the learners' motivations are both extrinsic and intrinsic, which leads to a discussion of their implications at the end of the chapter.

Chapter 6: Motivated by the rapid increase of K–12 Chinese language learners in the United States, Xin Zhang looks into the classroom motivations of young learners from preschool to elementary age and their parents' beliefs. Through classroom observations, and parental surveys and interviews, the researcher reports that the linguistic and cultural background of the parents was a factor influencing parental motives. On the other hand, teacher discourse and activity design were the key elements affecting young learners' classroom motivation.

Chapter 7: Wenying Zhou provides detailed descriptions of many practical and effective teaching techniques of content-based instruction (CBI), a type of approach deemed suitable for teaching in an immersion learning environment. The purpose of this chapter is to give innovative CBI teaching ideas to assist immersion students' learning of different subjects through the Chinese language medium.

Chapter 8: Ko-Yin Sung, Hsiao-Mei Tsai, and I-Chao Hung attempt to find an effective method of teaching Chinese characters to young learners, and take the concept of chunking as the framework for their study. The use of chunking is a decomposition procedure which saves learners' memory storage. To remember characters, learners only need to memorize chunks instead of each stroke in the chunks. Their study results found that chunking significantly increased the learners' radical and character configuration knowledge, and the knowledge was well retained in a delayed test.

Chapter 9: In this chapter, Yan Xie studies how the presence or absence of orthographic assignments influence character learning strategies. Through the use of the Strategy Inventory for Character Learning, interviews, and an open-ended survey regarding strategy change, Xie concludes that orthographic assignments have a strong impact on strategy choice and that an appropriate amount of orthographic study is important to make assignments effective.

Chapter 10: Lan Zhang examines learners' Chinese character writing characteristics through writing and discovers six different types of errors. The different kinds of errors revealed that the learners developed a certain degree of sensitivity to the graphic structure of the characters. However, the learners made errors related to the characters as a holistic unit, which implied that stroke presentations along with radical and phonetic component decomposition are important teaching points.

Chapter 11: Hsiu-Jen Cheng and Hong Zhan's chapter investigates the effectiveness of multimedia-assisted tools with different levels of learner control in aiding the learning of traditional Chinese characters by learners who already had knowledge of simplified Chinese characters. Through learner surveys and interviews, the authors found that a low level of learner controls

assisted learners' character recognition while a high level of learner controls helped learners in understanding the character meaning.

Chapter 12: Xiaoshi Li and Wenying Zhou's chapter investigates the effect of Chinese character video games on learners' writing compared to the traditional handwriting approach. The results of the year-long experiment illustrated that the games were more effective than the handwriting approach in learning character stroke order. Moreover, the use of the APP games is not constrained to class time and location, giving instructors time available to focus on the teaching of other important features.

Chapter 13: The research team of Justin Olmanson, Xianquan Liu, Christopher C. Heselton, and Asha Srivastava developed a Chinese writing application, DaZiBao, which offered multimodal audio, visual, and cross-linguistic scaffolding to help learners make connections between pronunciation- and character-based writing. Through observations, server log data, and interviews, the team reports positive results of the software in influencing the learners' writing development.

Chapter 14: Sujane Wu and Yalin Chen's chapter introduces the development of the Chinese Character Literacy (CCL) project, which adopted a learner-centered multimodal approach for learning. Via video analysis, the researchers believe that the project allowed the learners to take ownership to explore the ways he or she prefers to learn. Other learning benefits were also identified and are discussed in the chapter.

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Chapter 1

STARTALK eTower

Increasing Chinese Language and Cultural Proficiency Through Open Access Online Technology

Dali Tan, Angela Gunder,
Shaoyu Chi, and Susan Picard

INTRODUCTION

Moving Chinese language learners from lower to higher levels of language and cultural proficiency is highly dependent upon open access to quality resources. Due to advances in technology and readily available access to computer assisted language learning (CALL), educational resources for Chinese instruction have become more prevalent. As a result, there is an opportunity for both designers and educators to both create and employ these resources within the classroom as a means of extending Chinese language and cultural teachings to a greater number of students. Through the support of the federal grant program STARTALK, the authors founded the eTower Project, a design initiative focused on creating open educational resources for Chinese language students. Their work has included the creation and distribution of a set of free learning modules that target students who have started to learn Chinese, but have limited access to ways to continue their studies. STARTALK, a project of the National Foreign Language Center (NFLC) at the University of Maryland and funded by the National Security Agency, provides grants to institutions across the United States to host creative and engaging summer language learning experiences for students (K–16) and professional development programs for teachers of less commonly taught, critical need languages. The goals of the STARTALK program are to increase 1) the number of students enrolled in the study of critical need languages,

2) the number of highly effective critical language teachers in the United States, and 3) the amount of highly effective materials and curricula available to those teachers. Over the last decade, STARTALK has partnered with institutions and experts in the field to develop resources that strengthen the infrastructure in place for world language learning in the United States. These free and open resources range from model and sample thematic units and curricula, classroom videos, assessment tools, and other resources based around the STARTALK-Endorsed Principles for Effective Teaching and Learning. All resources developed by STARTALK can be accessed for free online at startalk.umd.edu/public/searchresources.

STARTALK awarded the eTower Project (composed of educators from Northern Virginia Community College) an Infrastructure Grant in 2015 for the development of an open educational resource (OER) in support of the mission to increase the number of highly effective resources available to teachers and students of Chinese. OER are educational materials that can be freely used, shared, adapted, or combined with other resources for use in teaching and learning (DeRosa & Robinson, 2017; Hilton et al., 2011). With this grant, the authors built infrastructure needed to support what they envisioned to be a comprehensive set of free-standing modules that learners could access individually or as a progressive learning opportunity. As the main focus of the project, the authors created a framework for interactive language lessons that weaves together an authentic culture and standards-based curriculum with best practices for fully online teaching and learning. The technology powering the eTower learning modules was designed for seamless access, allowing users to complete the assignments within the OER from computers and mobile devices alike.

The learning modules encompass an overarching theme, "Dialogue with Life—Pearls of Ancient Chinese Wisdom for the 21st Century World (对话人生—古代中华智慧点滴和当今世界)," incorporating a variety of authentic materials related to "Qingmingshanghetu" (Along the River During Qingming Festival).

BACKGROUND

Launched in 2006 under a contract from the National Security Agency, STARTALK sought to increase language proficiency through the facilitation of programs for both students (K–16) and teachers of critical needs languages. Guiding the design and facilitation of all STARTALK programs are six principles for effective teaching and learning: (a) Implementing a Standards-Based and Thematically Organized Curriculum; (b) Facilitating a

Learner-Centered Classroom; (c) Using the Target Language and Providing Comprehensible Input for Instruction; (d) Integrating Culture, Content, and Language in a World Language Classroom; (e) Adapting and Using Age-Appropriate Authentic Materials; and (f) Conducting Performance-Based Assessment (Ingold & Hart, 2010). The eTower Project focused on employing these principles in the design of an OER that would specially target Chinese language learners who had had some instruction, but were looking to continue their instruction. The choice of the name "eTower" was deliberate in that a tower traditionally symbolizes a hierarchical structure. In that same vein, the lower levels of the eTower modules contain learning objects of a more basic level, targeted for lower levels of language proficiency. Higher levels contain more complex instructional material, intended for learners with a higher level of language proficiency. An action research method was used in the creation of a prototype (Baskerville & Wood-Harper, 1998) to ensure that the design was user centered (Nielsen, 1994). Additionally, as a means of gaining a better understanding of how users would build on prior knowledge, the modules were strategically designed out of sequence. The first sample module was built with the moderately high-level learner in mind, allowing the authors to highlight and feature the complexities and nuances of advanced language and cultural instructional objectives possible in an online environment. STARTALK's support of this project was in line with their larger mission to prepare Americans for improved international relations, as well as solidifying national security and global economic competitiveness in the years ahead (Ingold & Hart, 2010). In 2016, the eTower Project was awarded an additional STARTALK Grant to continue developing modules, and it is the authors' hope to eventually create around twenty modules as a way to reach more learners of various language proficiency levels.

RATIONALE AND DESIGN PROCESS

The eTower Project began with the intent of decreasing the number of students with limited access to Chinese language learning materials. The goal was to target students who had taken part in introductory studies in Chinese, but had found themselves with no additional opportunities to continue their language learning. Preliminary research by the team revealed that of the few quality Chinese learning materials available as OER, few were personalized to the unique needs of critical language learners seeking to bridge their studies to prior knowledge. The eTower Project sought to utilize the power of OER to keep students engaged in their language learning, as OER remove impediments to access, keeping engagement and completion rates high

(Lane, 2009). Utilizing web 2.0 technology, the activities within the eTower modules adapt and personalize to the learner, allowing students to meet their unique academic goals in an openly accessible environment. The technology powering the learning modules is designed for seamless access, allowing users to complete the lessons from a computer or mobile device. All of these measures combined serve to remove obstacles preventing learners from continuing their education, helping them to persist through the modules, opening their eyes to larger language learning opportunities, and connecting them to rich tools to increase their language proficiency and cultural understanding.

As a means of ensuring that the modules would meet the same outcomes as the traditional, face-to-face classroom, the authors also determined that there would need to be a method for ensuring that student performance would include listening, reading, speaking and writing, coupled with real-time feedback. The eTower curriculum uses Integrated Performance Assessments (IPA) consisting of authentic materials that integrate language, content, and culture in more meaningful ways than traditional assessments that serve as mere audits of student learning. The IPA model integrates instruction and assessment—students learn new content that is rich in culture, while simultaneously being assessed via three modes of communication—interpretive, interpersonal, and presentational (Adair-Hauck, Glisan, & Troyan, 2013). Among the nine tasks in the interpretive phase of the IPA model, learners receive immediate feedback on their performance through such activities as recognizing key words, identifying supporting details, selecting organizational features, guessing meaning from the context, selecting the author's perspective or point of view, and justifying their answers with information from the text. For the rest of the tasks in the interpretive phase of the IPA model (main idea[s], inferences, comparing cultural perspectives, and personal reaction to the text), along with the tasks in interpretive and presentational phases, learners self-evaluate their work via sample answers and examples of anchor work. Whenever learners are asked to provide justifications for their choices in the IPA, sample answers are provided as well after students have submitted their answers. This way, students have not only textual models as good examples, but they also receive additional target language input. With creative uses of technology, the authors were even able to create the interpersonal stage of the IPA in the form of a simulated conversation. The simulated conversation is similar to the one in the AP Chinese Exam. However, the simulated conversation on the eTower sample module has language function requirements for student responses so they can practice what they have learned in the unit. The integrated approach of offering free access to both content and real-time feedback provides the direct benefit of reaching learners needing ways to continue their studies, as well as the indirect benefit of supporting instructors in need of robust and interactive performance-based assessments for use in their classrooms.

Curriculum and Instructional Design

In that the authors sought to create a prototype (http://etower.nvcc.edu/) that would serve as the benchmark for all subsequent design work, they chose to take a systematic approach to the planning and development process. This was essential given the formidable challenge of presenting adaptive and engaging learning content to users in an asynchronous, self-paced environment. The authors employed a blend of design methods, from the basic framework of the ADDIE model (Analysis—Design—Development—Implementation—Evaluation) (Allen, 2006) to the sequential waterfall model (Royce, 1987) and the adaptive agile software planning (Beck et al., 2001) regularly used in software development. Additionally, curriculum, technology, and design decisions were guided by the STARTALK Principles for Effective Teaching and Learning (Ingold & Hart, 2010). Throughout the development process, the authors conducted formative assessments to ensure that all learning outcomes and design goals were supported with each iteration of the product. In the sections below, the authors outline a detailed description of the practice employed in the creation of the eTower modules. While technology has become ubiquitous in language learning, standards-based applications of technology aligned to learning objectives are less frequently found. As such, the authors spent significant time on the planning of the curriculum for the pilot module. They began with a Target User Assessment to identify the learners, their prerequisite knowledge, and their unique learning goals. It was determined that users would progress through each module following a specific sequence, to include a pre-assessment, interactive instruction, learning activities, and practice activities with some feedback, and a final IPA with interpretive, interpersonal, and presentational tasks. Each self-contained module addresses the varying levels of knowledge among users with custom feedback at every stage in the sequence.

Learning Strategies

The authors wanted to teach students to not only work diligently at learning Chinese, but to also work efficiently. The Chinese proverb goes, "磨刀不误砍柴工 (Sharpening or grinding an axe will not hold up or delay the work of cutting firewood)." Teaching learning strategies to students was of vital importance to the curriculum, thereby equipping students with effective learning strategies, showing them how to be active learners, and resulting in what the Chinese would call 事半功倍 (to yield twice the result with half the effort). When students review and study new 量词 (measure words), the module quotes famous film director Federico Fellini, "A different language is a different vision of life." To help deepen learners' understanding of the Chinese measure words concept, they are reminded that the Chinese measure

words represent how the Chinese people categorize or classify things around them in the world. For example, after reviewing and studying a series of items that use measure word 条, they are presented with higher-order thinking questions as an immediate follow-up: "What can we see as the common characteristic of objects and animals that use '条 tiao' to measure?" In this way, learners are encouraged to draw their own conclusions first, and then receive targeted feedback if requested, "In some senses, they all seem to be long and strip-like objects and animals." Another example includes informing the learners that 偏旁部首 (radicals) are very important in our study of Chinese, since a good grasp of Chinese radicals can help them 举一反三 (to draw inferences about other cases from one instance). They are reminded that mastering the radicals can help them extrapolate embedded semantic information in the Chinese characters, and also help them remember Chinese characters quickly. When they encounter new words that they have never seen before, radicals can help them guess their meaning from the context. Sometimes, radicals can also provide them with some clues about the pronunciation of the characters. Radicals that can indicate the meaning of the characters are semantic radicals, while radicals that hint at the pronunciation of the characters are phonetic radicals. Most of the Chinese characters are phonograms that consist of both these semantic radicals and phonetic radicals.

Cultural Instruction

The authors decided to use "清明上河图 Qingmingshanghetu (Along the River During the Qingming Festival)" not only because it is a national treasure both known and beloved by the people of China, but also because of the great interest and fascination that American learners of the Chinese language and culture have shown for the different versions of the painting. Utilizing the painting in the eTower modules was a natural progression. The painting offers vivid representations of the breadth and depth of the different aspects of Chinese culture. The content of the painting was comparatively easy to mold into curriculum that could be differentiated for various learner proficiency levels and ages, all the while adhering to all six of the STARTALK Principles for Effective Teaching & Learning. The painting, as well as its enormously rich cultural and historical content and context, provides a powerful thematic center for our standards-based curriculum for all of eTower. The painting also provides a fertile ground for learners to conduct meaningful and in-depth cultural exploration in which they identify, examine, and analyze the relationship among cultural products, practices, and perspectives in Chinese culture and their own culture. Students can explore the following questions as they compare cultural perspectives: (a) Do you think that an old painting depicting the detailed daily life of ordinary people in a city in the

United States would generate as much interest among Americans?; (b) How do the practices of creating different versions of Qingmingshanghetu and recreating it in different artistic forms reflect the Chinese cultural perspectives? Through their reflection on the first question above, the hope is that our learners will find that a similar painting might not generate as much interest, artistic creativity, and imagination in the United States. Additionally, there is a desire for learners to find that, comparatively speaking, American society puts more emphasis on individualism, while Chinese society views collectivism as more important. Therefore, American traditional heroes are often individuals like the cowboy in Western films, or superheroes such as Superman and Spiderman, who often save the world from evil singlehandedly. In contrast, Chinese society seems to emphasize the family, clans, and collective prosperity. Through the study of the modules within eTower, learners begin to comprehend the aforementioned contrasting societal perspectives, particularly that because over 5,000 years of Chinese history has been troubled with war and poverty, the Chinese people long for peace and security in their lives. As such, it is no surprise that as a people, they are enamored with paintings that depict peaceful and prosperous lives for people of all walks of life, to include the ordinary people. In terms of analyzing the practice of creating different versions of Qingmingshanghetu, learners become aware of the fact that variations in Qingmingshanghetu all depict the flourishing and prosperous urban life in the peaceful heyday of Chinese history. The different versions of the painting also show the harmonious social relationship among people, and between people and nature. Lastly, fostering the importance of the modules themselves, we used the well-known Chinese saying 读万卷书，行万里路 (Read ten thousand books and travel ten thousand miles) to highlight the importance of exploring knowledge as a way to open up the world. It is no exaggeration to say that the majority of the Chinese people believe that the best education in the world should consist of 读万卷书，行万里路, and the eTower modules encourage this spirit of discovery and learning.

Instructional Technology and Media

Once the curriculum was established for the modules and the chief instructional goals outlined, the authors began the process of selecting technology applications that would effectively support the learning content. Using principles from the SECTIONS model (Bates, 2015), applications were chosen specifically for their ability to reach and engage a diverse population of learners. The authors selected the authoring software Articulate Storyline as the primary delivery mechanism for instruction because of its ability to present various types of multimedia (text, images, animations, video, and audio), create branched feedback loops for differentiated learning scenarios,

and display content in both Chinese and English. Additionally, content from Storyline could be published as HTML5, meaning that students would be able to access the modules from computers, tablets, or mobile devices. In that the IPA requires students to interpret written and spoken language and receive feedback in real time, there was a need to build activities within Storyline to support experiential, active learning in the target language. Storyline provided the authors with the ability to create listening and writing activities natively within the software, to include different levels of feedback and assistance. Students receive unique answers based on their selections, and if they need help, they are not immediately presented with help in English. Rather, they progress through a series of varied hints, which give them only so much of the answer as they need in order to select a correct response. In this way, they are kept in the target language as much as possible, just as would happen in a face-to-face immersion classroom. In order to allow students to record their voice, a third-party application called Audior was utilized as an embedded tool within the Storyline modules. After students record their audio, they are presented with anchor work so that they can evaluate their response and re-record as necessary. In keeping with the spirit of free and open access to learning content, the authors utilized a variety of OER media and external resources in order to create the look and feel of the modules. The painting Qingmingshanghetu was sourced as two separate versions under a Creative Commons license from Wikimedia Commons. Illustrations, images, and photographs utilized within the modules were also selected from databases offering media in the public domain. Additionally, the entire site is built upon a responsive and mobile-friendly template built in HTML5/CSS3 by the website HTML5Up (https://html5up.net/) which offers designs for free with attribution. The intentional use of various OER and publicly available media served us as a means of furthering our support for the use of quality open educational resources to expand access to learning content.

Evaluation and Assessment

Formative evaluation of the lessons was integral to the design process, and the authors utilized several instruments to ensure that the content was carefully curated and presented. They leveraged the principles outlined in the MERLOT Evaluation Rubric for Open Educational Resources (Cafolla, 2006) to assess the overall quality of the content, the potential effectiveness of the module as a teaching tool, and the ease of use. This rubric was particularly suited to the evaluation of eTower, an OER, as MERLOT (www.merlot.org) is a vast and diverse collection of peer-reviewed OER curated and shared by contributors internationally (Malloy & Hanley, 2001). The authors also incorporated several key standards within the Quality Matters rubric, including

design strategies to promote essential standards covering access, usability, learner autonomy, and engagement. Employing these instruments for quality assurance provided unique perspective on the effectiveness of the materials that were created, and the opportunities available for further improvement.

KEY DESIGN COMPONENTS

In terms of the outcomes of the creation of the modules, the initial prototype and subsequent modules afforded several benefits to not only students utilizing eTower, but also to those in the field looking to extend the impact of critical language instruction. In the following sections, the authors highlight three integral design decisions and how each was impactful in actualizing the mission and vision of the modules.

Integrated Performance Assessments

In that the online environment is meant to serve as an extender of access without becoming a weak approximation of the face-to-face learning experience, educators and designers must consider how best to include meaningful and rigorous assessments that measure understanding and provide timely feedback. Situating the design of the modules around an IPA framework allows for a dynamic look at assessment, one that takes into account what the learner knows based on reflection, performance, and connections to real-world practice. "Dynamic assessment—which focuses on interventions that facilitate improved learner performance—offers a potential seamless connection to instruction, since its role is to assist and improve learner performance as well as to strengthen instructional processes" (Adair-Hauck et al., 2006, p. 363). With the IPA as a means of connecting standards-based language learning to classroom performance, the use of the framework within a fully online asynchronous environment helps to ensure that student performance moves beyond rote memorization and recitation. Making that connection to prior knowledge and the real world is critical to deeper engagement and hallmark to the IPA: "IPAs were designed to assist teachers to begin to respond to questions such as: 'Am I assessing performance using standards-based and real-world tasks that are meaningful to students?" (Adair-Hauck et al., 2006, p. 365). Additionally, utilizing the IPA as the blueprint for the assessments in the eTower modules allowed the authors to contextualize the movement through all of the lessons as a journey, with the individual user established as the leader on their journey. Real-time feedback underscores this relationship between the user and the system. It shows the learner the path in front of them, gives them greater insight into the learning process itself, and at its

best, celebrates their progress on the journey to meet the articulated learning outcomes. The IPA embeds the assessment within the performative tasks, as opposed to relegating it to the end of the lesson. This integration, when revealed to students, has led to positive perceptions of the instructional experience and this intentional reorganization of the learning events (Zapata, 2016). Furthermore, the IPA highlights the unique relationship between the educator and the learner—student performance provides data to the educator, which is then met with feedback to support future performance (Adair-Hauck & Troyan, 2013). The eTower modules are designed to highlight this push and pull of information, with the system honoring the work completed and serving out tailored content based on the data received.

Adaptive Learning

In addition to the creation of meaningful and academically rigorous assessment practices in the online environment, learning designers must also support student agency and autonomy as they move through content. Adaptive learning involves systems that consider what the learner can do, determines where gaps exist as related to the overarching learning outcomes of the lesson, and then presents personalized content to address those gaps directly (Kulkarni, 2012). Critical to successful CALL is the organization of content such that learners are served what they are in need of in real time. This is in line with the facilitation of an IPA in an in-person classroom—the system assesses and tailors feedback on performance of an individual activity at a granular level. Additionally, the system makes recommendations as to where learners should go next based on how they've done, carefully determining the shortest path to helping them meet the learning outcomes for the lesson. The design of the eTower modules within Storyline affords the opportunity to create a personalized learning experience rooted in the dynamic assessment practices of an IPA. Each piece of content, from the time spent viewing a discrete piece of content to a click of the mouse, can be tracked and measured, giving the system information about what to offer the student next. The organization of these learning paths is an analog process, and one that takes deliberate planning and effort. At times, the determination of how the user will move through the content is more involved than the actual technical design. However, once these paths are determined, the system caters to students with high-touch feedback on their reading, writing, listening, and speaking abilities. This personalized learning at scale is one of the most promising advances with CALL—learners are aided by a veritable guide on their side without the limitations of synchronous contact. While no system serves as a replacement for human-to-human contact, the use of CALL allows learners to extend the reach of immersion in the content, particularly for those lacking

any other means of accessing lessons and feedback. Using CALL as a bridge to synchronous points of engagement (as both traditional face-to-face and online connections in real time) increases time on task, creates opportunities for ample practice, and allows the learner to intrinsically understand where they are in their learning journey through continuous assessment and reflection. In this way, the learner becomes the driver of their experience, making informed decisions as to how they will meet the articulated learning outcomes placed before them.

Open Educational Resources

In support of the STARTALK mission to increase the number of educators and speakers of critical need languages, the eTower Project has turned its focus to the issue of access to education. In service to this mission of access, designers and educators must take a critical look at the obstacles on the path and address those challenges. In that wide swaths of the country are without consistent and dedicated access to instruction to less commonly taught languages, OER serve as a means of closing this gap. Chiefly, OER have the ability to remove the impediments of lack of funding for materials and ensure pervasive and consistent access to content. Educators can build learning experiences from the materials freely offered by their colleagues and can tailor them to their specific populations of learners (Beaven, 2013; Cronin & MacLaren, 2018). Learning objects can be remixed, iterated upon, and combined to better serve the needs of the target audience, and can then be shared out as new versions of the content. Beyond the benefits to institutions and educators, the advantages offered to learners are vast and rich, to include illuminating the importance of independent and informal learning, particularly in locations where no formal opportunities for education exist (Lane, 2009). The authors determined early on that in order to be the most impactful with the design of the eTower modules, all materials would need to be provided openly and freely for all to use, remix, and distribute. Additionally, the realia utilized was curated from open databases so as to model the effectiveness of creating engaging and authentic learning objects with freely sourced media. It is the hope of the authors that more educators and students will realize the abundance and quality of open educational resources and take part in a rich community of open teaching and learning.

CONSIDERATIONS AND FUTURE EXPANSIONS

For those seeking to replicate the practices employed in the creation of the eTower modules, there are several considerations informed by the lessons

learned throughout the design process. The authors placed a focus on incorporating authentic learning objects that were licensed for use in open educational contexts. As such, significant time and effort were expended in curating and vetting appropriate materials for use in the modules, particularly in that media within the open databases is not always consistently sorted and tagged. Additionally, there are technical costs associated with implementing a series of interactive learning objects—hosting space must be acquired, and adaptive software like Articulate Storyline can be expensive for those looking to build comparable learning objects to those constructed for eTower. While the designers wanted to use as many free resources as possible in the build out of the modules, the reality was that if it were not for the grant funding for the software, certain interactive elements would not have been able to be implemented. For the adaptive learning elements, free products were explored, but none had the depth of functionality required to support the feedback and assessments as designed by the authors. Though it was the eTower Project's hope that all free products might be used to allow for anyone to adopt the same methods employed to create their own modules, it was determined that the interactivity outweighed the cost, and that others would most likely need to do the same.

One of the greatest challenges with creating an OER of eTower's level of detail has been ensuring compliance of delivery and accessibility. The designers sought to create the modules with Universal Design for Learning in mind, a strategy that seeks to make all content accessible for learners' needs and preferences (Rose, Gravel, & Gordon, 2014). This meant that certain technological applications and approaches were excluded given their inability to meet Americans with Disabilities Act (ADA) standards. Additionally, other applications were used with caution, particularly those requiring aging plugins like Flash and Java that require users to download software and perform frequent updates. As applications were chosen, there was a need to be strategic about the number of elements used so as to keep the site lightweight and quick to load. This was intentionally meant to aid those visiting the site on mobile devices (particularly those using data as opposed to WIFI) and those without access to high-speed internet. Media was scaled to be accessible without sacrificing quality or readability, and the site was evaluated for performance and speed using web checkup tools. Ultimately, the aim was to provide a consistent experience for all users of the site, regardless of their technical specifications or needs for accommodations.

Above all, the time and personnel required to plan and develop the modules was significant. With the need to create tailored feedback, detailed transcripts, and an adaptive learning environment, interpreters, voice actors, instructional designers, and technologists were all employed, with most needing to be proficient in the target language. Recruiting a diverse and collaborative group of educators to plan and deliver the many pieces of the modules was critical to

eTower's success, and time and effort was expended on unifying the various elements into one cohesive voice. Moreover, keeping the site up to date over time and minimizing the number of updates required a great deal of effort up front during the design process. This was necessary given the fact that the project was grant funded and the likelihood of consistent support in perpetuity was unknown.

In the initial planning stages, it was discovered that some of the eTower Project's wish list items were not quite achievable with the technology readily and affordably available. Since the inception of the eTower modules, advances in technology and effective practices for delivering language instruction in the online environment have opened up new doors for future upgrades to the design of the interface and associated functionality. Sound wave analysis continues to evolve, with free tools from Google and applications such as Dragon Speech Recognition providing more accurate text-to-speech than ever before. Future work of the eTower Project would ideally include researching integrations of this functionality into the interactive pieces within Storyline to expand the detailed feedback output from the system. Additionally, adaptive learning platforms continue to expand in their ability to curate personalized experiences for users based on the data that is collected through interactions. Articulate has expanded the functionality of Storyline, as well as released new products such as Rise, to give users more options for how they design and deploy interactive media for release in myriad contexts. Free interactive learning tools such as Playposit (https://www.playposit.com) have also added adaptive release and branching scenarios to their toolkit, giving educators lightweight and flexible ways to create CALL at any scale. Lastly, tools for building community among populations of asynchronous learners exist as a means of mitigating feelings of isolation as an individual learner. Tried and true tools, such as the visual discussion board tool VoiceThread (https://voicethread.com/), as well as newer video board tools like FlipGrid (https://flipgrid.com/), are free, easily implementable, and bring the human element to the online environment. Humanizing the online space helps to support learner motivation and persistence, thereby encouraging students to reach higher levels of proficiency (Weiss, 2000). In that same vein, creating spaces for immersive learning can help to encourage persistence through the content. Advances in virtual and augmented reality can bring learners to new locations, moving beyond the limitations of space and time (Dede, 2009). The designs of classic implementations of virtual reality, such as the Chinese Garden (https://maps.secondlife.com/secondlife/Qoheleth/234/104/22) and the Chinese Island (https://maps.secondlife.com/secondlife/Monash%20University%202/62/209/26) in Second Life, and detailed 3D mappings of cultural monuments and heritage sites in Google Earth (https://www.google.com/earth/), have informed the evolution of mixed reality spaces that can be readily integrated into curriculum. These tools have the power to open access to content, media, and concepts that were previously considered inaccessible, and would serve as a welcome addition to modules similar to eTower.

Looking to the future, the eTower Project is energized by the promise of further expanding the modules and the framework utilized to create the instruction. This includes creating versions of the modules that might be downloaded and accessed without the internet and deployed within a variety of curricula. The authors plan to focus on expanding access by building additional modules that encompass the entire spectrum of language proficiency levels, starting with Novice Low, as well as targeted language preparation for Advanced proficiency scale students seeking to take the Advanced Placement Chinese Language and Culture Exam. Additionally, once this phase of development is complete, they hope to extend their design and development practices to the creation of similar modules for other critical need languages. While the modules were well received by students during the limited pilot release, the authors seek to collect data on the effectiveness of the modules as well as faculty and student perceptions on its ability to bridge learners to higher levels of proficiency. Hopefully, the collection of this data will help to expand the reach of the STARTALK mission by encouraging more educators and students to engage in the usage of the resources created as part of the grant.

CONCLUSION

Related to the accessibility of our module, it was important for the authors to create a model that could be carried on by others in the creation of their own open educational resources. While the modules themselves are wholly open and available, future plans include releasing expanded documentation of the design plan, to include detailing the time for development, the specific challenges that the authors faced, and the unique opportunities afforded to the authors in the process of designing the modules. Looking to future development of the modules, the authors recognize the pervasive challenge faced by many creators of open education resources—the maintenance and upkeep of OER for quality and currency. As such, the authors seek to continue work on the development of learning modules that will address the gap in language learner persistence. The following three goals have been established: (1) to build off of the creation of the first asynchronous, online learning module for STARTALK students of Chinese with the creation of other new modules so students can work through these modules gradually to move up the proficiency level to AP level and beyond; (2) to embed within each module performance-based assessments and an IPA for students in need of practice and meaningful feedback; and (3) to integrate the STARTALK Model Curriculum into the eTower learning content as the framework upon which the modules will be built. Future phases may consist of expanded access to assessment tools external to eTower, including saved user data in student accounts, connections to computer-based assessments, and opportunities for earning college credit based on solid performance within the modules. Lastly, and most importantly, the authors hope to

continue research on the effectiveness of the modules, collecting data on usage, student persistence, and the importance of the integration of language learning strategies within the instructional content. These efforts, in totality, will help to move the needle a little further on student autonomy over their language learning, thereby demonstrating that personalized, experiential language and cultural education can be designed for access and scale.

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DETAILS AND LINK ADDRESSES FOR FIGURES IN THE ARTICLE

Figure 1.1. Demonstration of STARTALK eTower's responsive design, which resizes content to fit on any type of device. Retrieved January 4, 2018, from http://etower.nvcc.edu/. Screenshot by authors. Device graphics designed by Freepik.

Figure 1.2. Screenshot of a module utilizing images and animations from the famous painting Qīngmíng Shànghé Tú. Retrieved January 4, 2018, from http://etower.nvcc.edu/modules/12/story_html5.html. Screenshot by authors.

Figure 1.3. Screenshot of a module highlighting the intended learning outcomes. Retrieved January 4, 2018, from http://etower.nvcc.edu/modules/12/story_html5.html. Screenshot by authors.

Figure 1.4. Sample activity within a module built using Articulate Storyline. Retrieved January 4, 2018, from http://etower.nvcc.edu/. Screenshot by authors. Device graphics designed by Freepik.

Figure 1.5. An explanation of the Integrated Performance Assessment rubric used to evaluate the assignments. Retrieved January 4, 2018, from http://etower.nvcc.edu/modules/12/story_html5.html. Screenshot by authors.

Figure 1.6. Sample activity constructed as an Integrated Performance Assessment. Retrieved January 4, 2018, from http://etower.nvcc.edu/modules/12/story_html5.html. Screenshot by authors.

Figure 1.7. Sample feedback interface for a module activity constructed as an Integrated Performance Assessment. Retrieved January 4, 2018, from http://etower.nvcc.edu/modules/12/story_html5.html. Screenshot by authors.

Chapter 2

Learner Autonomy and Chinese Vocabulary Learning with Technology

Yalun Zhou and Michael Wei

With the accessibility of language learning technologies, language learning outside of the classroom has become an increasingly integral part of formal instruction (Stauffer, 2014; Xu, 2015). Such integration is, nevertheless, the result of implementing computer-assisted language learning (CALL) in language classrooms. CALL not only changes the format of learner-technology interaction but also enhances language learners' motivation in learning (Alm, 2006). Specifically, in vocabulary acquisition, learning vocabulary is the first and utmost important task for all foreign language learners, yet least studied research area in classroom second language acquisition (SLA). Exploring the capacity and effectiveness of computer technology in vocabulary instruction is, therefore, highly important (NRP, 2000). However, there is a dearth in vocabulary instruction research in CALL (Laufer, 1986; Yamamoto, 2014).

To better understand how internet-based vocabulary games can promote learner autonomy in vocabulary learning, this chapter shares the results of classroom research in a college-level beginners Chinese as a foreign language (CFL) course. Under the framework of motivational dynamics in language learning (Waninge, de Bot, & Dornyei, 2014) and designing a course as a multiplayer classroom (Sheldon, 2012), this classroom vocabulary instruction research intends to explore the effects and student perspectives of technology-assisted pedagogy. The hopes are the technology-enhanced pedagogy can 1) inform vocabulary instruction with digital game competition, and 2) enhance learners' motivation and autonomy in CFL vocabulary learning. Through course reflection, learner feedback, vocabulary competitions, and tests, the results demonstrate that vocabulary game competitions promote engaging vocabulary learning and learner autonomy. The research-proven pedagogy draws attention to strategies in CALL vocabulary instruction research and

praxis for motivation and learner autonomy. The findings shed lights on the Directed Motivational Current (DMC) model by Dornyei, Muir, and Ibrahim (2014) that stimulates second language learners to perform to full potential.

LANGUAGE LEARNING AUTONOMY AND TECHNOLOGY

Learning autonomy means learners take charge of or are responsible for their own learning (Benson, 2001; Holec, 1981). Since Holec first proposed this concept almost four decades ago, learner autonomy has gained great attention in foreign language learning. Learner autonomy is "learners' ability to take responsibility for their own learning and to apply active, personally relevant strategies" (Benson, 2006, p. 23). When students have ownership of their own learning, are able to set their own goals and choose learning methods, they have proactive autonomy in learning (Littlewood, 1996). Autonomous learners perform learning activities and make decisions independently without the teacher's intervention (Dickinson, 1987).

Although CALL dates back to the 1960s, technology-mediated learner autonomy has not drawn attention until mid-1990s (Reinders & White, 2016). Since the advent of Web 2.0 and mobile technologies, there has been significant interest in technology-enhanced or game-based theory and practices of language learning autonomy. The major contribution of computer technology to autonomous learning is facilitating learner autonomy through access of materials for self-learning at any place and any time (Godwin-Jones, 2011; Lyddon, 2016; Mutlu & Eroz-Tuga, 2013). The internet and mobile devices have broadened the concept of learner autonomy with the possibilities of self-paced access to varieties of learning contents (Lyddon, 2016). Language autonomy research, therefore, focuses on the opportunities that CALL brings to language learners and the use of CALL technologies in promoting language learner autonomy (Benson, 2006).

With the removal of limitations on what, when, and where to learn in CALL, research has proved that modern technologies have greatly promoted language learner autonomy. For instance, e-learning platform *Schoology* supports the development of learner autonomy by facilitating interaction and communication outside of class (Ardi, 2017). When applied to digital gaming or gamification, community-based gaming activities are an important part of learner autonomy. Autonomy is one of the keys to facilitating L2 (second language) learning through L2 gaming or gamification. Autonomy in a learning community is game players' self-organization and management of their own L2 learning practices. Gaming community supports language learners' autonomous development (Chik, 2014).

In addition to learner autonomy, teacher autonomy is crucially important in facilitating and developing learner autonomy. In their critical review of autonomy and technology in the past twenty years, Reinders and White (2016) summarized five themes in the research of autonomy: learner training and strategies, teacher autonomy, self-access and language advising, telecollaboration, and social technologies for learning. Among which, they highlight Kessler's (2010) argument that CALL teacher autonomy lies in "the ability to utilize, create, and manage CALL environments for integrated language skills development" (p. 378). Research (e.g., Benaissi, 2015) indicates that autonomy levels of language learners have direct effects on language learning. If teachers try to grow autonomous learners, it gets easier to achieve pedagogical goals in the language learning process (Sunar, 2016).

CALL VOCABULARY INSTRUCTION

Vocabulary instruction has been the most targeted pedagogical engagement since computer use expanded in education in the 1980s (Ma & Kelly, 2006). The goal of computer-assisted vocabulary learning is to make vocabulary learning, which was used to be learned through rote memorization, more interesting, more effective, and easier to remember (Chiu, 2013; Yip & Kwan, 2006). For instance, Zheng, Bischoff, and Gilliland (2015) demonstrated a two-hour vocabulary learning session within the MMORGs (massively multiplayer online role play games) game environment; de Haan, Reed, and Kuwada (2010) found the interactivity of music video games effective in L2 vocabulary recall.

In terms of environment of vocabulary learning, Bisson, van Hueven, Conclin, and Tunney (2013) found that multimodal exposures of vocabulary play an important role in facilitating vocabulary learning. The flexibility and accommodation of individual learning styles that CALL vocabulary learning offers to language learners allow for autonomous learning (Chiu, 2013). Online vocabulary games strengthened students' intention in autonomous learning (Yip & Kwan, 2006). Constructive competition in learning games places student players to learn in focus. It involves the student players' will to challenge themselves and the ability to know how to proceed in doing so. To compete constructively, the student player needs to be challenged by one's self or by others to take a small step. It involves wanting and daring to do the little extra to achieve one's goal of learning or to stretch one's own potential. Teachers can utilize constructive competition as a pedagogical means to motivate students to go beyond their own expected abilities (Sheridan & Williams, 2011). Yip and Kwan's (2006) research found that learners playing online vocabulary tend to learn better and could retain the learned vocabulary for a longer period and retrieve more words than those who just

learn from face-to-face lessons without playing the online vocabulary games. By comparison, vocabulary game player students have a higher degree of autonomy in their learning and they tend to be in control of their own learning when learning from vocabulary websites with games. Yi and Kwan further suggested that, to retain students' interest and ensure learning effectiveness, more motivating games that give students a sense of achievement and scope for development are needed.

Summing up, researchers found that gamified features in vocabulary learning (e.g., self-paced, self-directed, self-controlled) keep students aware of their proficiency, make them agents of their own progress, and motivate them to engage in sustained play (Abrams & Walsh, 2014). Although much has been done in gamified vocabulary learning research, the majority of this research is about learning English vocabulary. There is a dearth in research about gamified vocabulary learning in CFL classrooms. Researchers (e.g., Reinders, 2012; Peterson, 2013) point out the urgent need both for second language acquisition (SLA) theory informed research in game-based learning and for vocabulary instruction research in intact classrooms (Laufer, 1986). In addition, Yamamoto (2014) and Vandercruysse, Vandewaetere, Cornillie, and Clarebout (2013) have noted that limited qualitative research exists about learner perspectives on the use of foreign language learning games. Few studies have researched how CALL is practically and instructionally employed in Chinese as foreign language (CFL) instruction (Xie & Yao, 2008; Xu, 2015).

The study discussed in this chapter intends to fill the void by utilizing digital game competitions embedded in a Web 2.0 website, *Quizlet*, to motivate CFL beginners to learn vocabulary. Such classroom-based vocabulary instruction research, on one hand, sheds light on existing CALL vocabulary research in terms of the effectiveness of CALL. On the other hand, it provides empirical evidence to what insightful SLA experts (e.g., Nunan, 1991; Spada, 2005) called upon, that is, research findings from data that are collected from real classrooms with real students than those from experimental, laboratory data.

THEORETICAL FRAMEWORK

The theoretical framework that guides the innovative pedagogical design is twofold: questing in a multiplayer game classroom and motivational theory in SLA. Sheldon (2012) claims that designing a course as a multiplayer classroom enhances student motivation, student attitude, and student performance. While learning as questers or game players, students engage with several times more learning content than they do in traditional classrooms. The competitive motivation and determination students demonstrated in the

multiplayer classroom are ideal for vocabulary learning entailed in the *Quizlet* vocabulary games.

The second framework in SLA motivation theory states that self-determined and internalized-extrinsic rewards can be combined with or can lead to intrinsic motivation (Deci & Ryan, 1985; Dornyei, 1998); According to this motivational theory, people will be more self-determined in performing a particular behavior if the tasks engagement supports three fundamental human needs: a) autonomy (i.e., experiencing oneself as the origin of one's behavior), b) competence (i.e., feeling efficacious and having a sense of accomplishment), and c) relatedness (i.e., feeling close to and connected to other individuals). Under this framework, motivation is no longer seen as a stable variable in individual language learners, but continuously dynamic and changeable in the process of language development (Waninge, de Bot, & Dornyei, 2014). Within a certain context, language learners may demonstrate an intense motivational drive to pursue a language learning task (e.g., learning vocabulary). Dornyei, Muir, and Ibrahim (2014) define such motivational drives as Directed Motivational Current (DMC), "which depicts unique periods of intensive motivational involvement both in pursuit of and fueled by a highly valued goal/vision" (p. 9). In our understanding, the teacher is the director of the motivational current in the language classroom who decides when to do what to stimulate students' motivation.

In digital times, language learner autonomy is closely related to their perceptions, engagement, and evaluations of the technology-mediated learning environment (Renders & White, 2016). Going in the line of this and guided by the theoretical framework discussed above, the research questions (RQ) in the current study are as follows: RQ1. To what extent do gamified vocabulary tools (e.g., *Quizlet*) promote the learner autonomy of Chinese vocabulary learning? RQ2. What are the students' perspectives regarding digital game competition in Chinese vocabulary learning autonomy?

METHODOLOGY

Instructional Design with Consideration of Learner Autonomy

Over the past forty years, learner autonomy has gained considerable importance in the area of foreign language learning. The keys to developing student autonomy are intrinsic motivation and a social environment that supports autonomy building and motivates students to pursue optimal challenges (Ushioda, 2007). Empirical research proves that CALL is particularly useful to foster autonomous learning because it "naturally incorporate many elements of autonomy that give learners control over and responsibility for their learning" (Wash, 2012, p. 367). The Web 2.0 environment (e.g., *Quizlet*) that

enables learner activity to happen online and outside of class is, nevertheless, an ideal pedagogical platform to achieve such goals.

Following the theoretical framework and with building learner autonomy in mind, the central ideas for the instructional research design are to 1) normalize vocabulary learning with individual and group game competition, 2) maximize vocabulary learning in- and outside of the classroom with formative and summative assessment, and 3) empower Chinese language learners who are digital natives to be constructivists in vocabulary learning. After exploration and evaluation, we predicted that the multimodal learning formats of *Quizlet* for vocabulary learning, including tutorial function and individual and group game competition features, would satisfy the pedagogical goals (see figure 2.1). Among the variety of modes of learning with *Quizlet*, "Live" has the function of real-time group competition.

The focus of vocabulary instruction in this pedagogical design was explicitly using the *Quizlet* flashcard website to teach the vocabulary list in each lesson of the textbook. The pace of learning was twenty to twenty-five new vocabulary on a weekly basis. Throughout the week, after a mini-lecture of new vocabulary, students self-study and self-assess the mastery of the weekly vocabulary list on their own pace. The scoreboard on *Quizlet* will inform the students his/her standing of vocabulary learning or game competition. During class time, real-time, live group game competition and traditional paper-based vocabulary dictation are administrated by the teacher (see figure 2.2). With such pedagogical design and practices, the students were implicitly guided by the instructor to learn and build their autonomous learning skills, motivated by various game competition and vocabulary tests as figure 2.3 demonstrated.

Setting and Participants

Fifty-four (N=54) college students who took Chinese I in the fall semester between 2014 and 2017 at an American private technological institute participated in this study. The purpose was to understand how vocabulary games with online flashcards platform *Quizlet* can promote learner autonomy in CFL vocabulary learning. Most of the students did not have prior knowledge or formal instruction of the Chinese language. Students were expected to learn fifteen to twenty-four new words in each lesson and recognize pinyin, Chinese characters, and English meanings of each word. Every chapter's new words were entered into the *Quizlet* online flashcards website. The students met twice a week for 110 minutes each time. The weekly routine was a mini-lecture about the new vocabulary list on Tuesday, required *Quizlet* vocabulary gameplay on Wednesday, live group vocabulary game competition on Thursday, then self-paced vocabulary learning by using the chosen modes (figure 2.1) of vocabulary study on *Quizlet* throughout the week. Every two

weeks after the students have learned two chapter lessons, there will be a paper-pencil dictation to test students' mastery of pinyin, Chinese characters, and English translation.

Data Collection

The data were asynchronous students' game competition scoreboard and/or flashcards learning records on *Quizlet*, biweekly dictation tests, and weekly real-time live group competitions in class. After the students choose one of the modes of vocabulary learning or game, the scoreboard informs the study player the standing of the student in comparison with the whole class as well as the previous and current records of the student's own play (see figure 2.4). By looking at the scoreboard, the student can see whether this round of play hit the historical records of him/her. The comments generated from the *Quizlet* system, such as "Great improvement" or "Improved by 51,380 points," are an obvious motivator for the student to continue playing the vocabulary learning games until the student reaches his/her new personal records.

In addition to individual game play records, the students can also see a note about which of the classmates has kept a better score than him/her (see figure 2.5). By looking at this scoreboard, the student is informed of his/her standing of mastering the set of the vocabulary in the class, his/her best score, and who is doing better than him/her. Meanwhile, the student is also informed with the best record of the other student who is immediately better than him/her. Notes such as "Woohoo! You set a new personal record!" or "Now try to beat xxx's personal best of xx seconds!" encourage the student to continue playing the vocabulary learning games.

The *Quizlet* scoreboards can also inform the class top players of each mode of vocabulary learning game (see figure 2.6).

In addition to the asynchronous, self-paced vocabulary gameplay online, in-class, real-time live group competitions were administrated when needed, serving either as a warm-up or a class exit activity. In live competition mode, the game players can see both their team members' performance (see figure 2.7) as well as the live scoreboard for the race (see figure 2.8). In addition to the vocabulary gameplay scoreboards on *Quizlet*, there were also teacher-moderated vocabulary learning competitions so that the students were aware of their strengths and weakness in a certain vocabulary set. The teacher-moderated competition was not fixed as a routine nor stuck with a single mode of gameplay. It was administrated as needed by pedagogical needs. For example, the instructor held real-time matching game competition (see figure 2.9) in class and the paper version test of the self-paced asynchronous gameplay (see figure 2.10). The third set of data collected is questions related to using *Quizlet* vocabulary games and flashcards learning. These questions

were asked as part of course survey by the end of the semester. The survey questions related to the research questions of this chapter were:

1. The *Quizlet* website is helpful for learning Chinese vocabulary (1=strongly disagree; 5=strongly agree).
2. I like to beat myself when playing the *Quizlet* vocabulary games (1=strongly disagree; 5=strongly agree).
3. I like to beat classmates when playing the *Quizlet* vocabulary games (1=strongly disagree; 5=strongly agree).
4. What modes/function of the *Quizlet* vocabulary games do you like the most?
5. What is your motivation to play/compete with *Quizlet* vocabulary games?

DATA ANALYSIS AND DISCUSSION

We applied Patton's (2002) protocols of coding qualitative data for the open-ended questions. The results from Likert scales and open-ended questions indicated three themes from the data collected: 1) benefits of gamified vocabulary learning tools with *Quizlet*, 2) attitudes toward competition, and 3) learner autonomy to learn/compete. These results help answer the two research questions we proposed in this chapter:

RQ 1: To what extent do gamified vocabulary tools (e.g., *Quizlet*) promote the learner autonomy of Chinese vocabulary learning?

Among the fifty-four students who answered the course feedback questions, more than 97 percent of the students (78.14 percent strongly agree and 19.28 percent agree) thought *Quizlet* vocabulary games were very helpful in learning Chinese vocabulary. Answers from the open-ended questions indicate that the students were motivated to learn the new vocabulary through the multidimensional features of the online vocabulary games provided by *Quizlet*. Themes emerged from the data: a) motivation to achieve higher scores, b) motivation to see better vocabulary learning outcomes, and c) features that motivated the students to learn Chinese vocabulary with *Quizlet*. Some students were motivated to see how many times in a row they could get a perfect score or close to a perfect score of the vocabulary list. Some were motivated to spend more time playing the vocabulary flashcards or competing vocabulary games embedded on *Quizlet*. The aspects of *Quizlet* that motivated the students to learn are, to name a few, the different functions that *Quizlet* used to teach new material and the summary of words that the individual student did not get correct during the learning or gameplay. For example, the students said, "I like how it teaches you

vocabulary and makes you repeat more the words you get wrong." "I love the flashcard and learn features of *Quizlet*. The learn features really helped me to associate characters with their meaning." "It helps me solidify what I learned from the Hanzi worksheet." "I used the speller a lot because it helped me to recognize a character without seeing it, but only hearing it."

The positive comments on *Quizlet* vocabulary games reinforced what Bisson et al. (2013) claimed, that is, the multimodal CALL vocabulary learning facilitates language learning with the learner's choice of learning modes. The flexibility and accommodation of different modes of learning that *Quizlet* can offer to students allow autonomous learning with Chinese vocabulary. The self-paced, self-directed, and self-controlled *Quizlet* vocabulary learning games give students ownership of their vocabulary learning. As shown in the comments above, such ownership of learning motivates the students to engage in sustained play until they reach their goals of playing, be it learning meanings or spelling or fast recognition. The accessibility of multiple features that *Quizlet* vocabulary games could offer enables the students to choose the type of games they want to play based on their purpose of learning. For example, most students mentioned that they used the "Learn" or "Flashcard" function to intensively study the new vocabulary, then after they were familiar with the meanings, they either chose matching games or speller games or test function to review and assess their mastering of the new words of the week. The result of this study goes in line with existing research (e.g., Abrams & Walsh, 2014) that technology-mediated, game-based vocabulary learning promote learner autonomy in language acquisition.

On the other hand, the extremely high satisfactory rate (97 percent) of the students for the helpfulness of *Quizlet* vocabulary games in Chinese learning and high scores in the teacher-moderated competition and dictations (figures 2.9 & 2.10) illustrate the CFL learner profiles in this study. They were goal oriented and enthusiastic for Chinese vocabulary learning. For example, one student gave an example of how she could control the learning process: "I like the matching game and that you can 'star' certain words so that it is easy to practice specific words that I have trouble with." This is in contrast to those Chinese language learners in Yip and Kwan's (2006) study who felt vocabulary learning is boring. The pedagogical attempt in current study sheds light with researchers (e.g., Arnold & Ducate, 2011; Xu, 2015) who call for more technology-engaged learning activities that assist, promote, and/or extend Chinese learning beyond the classroom.

RQ2. What are students' perspectives regarding digital game competition in Chinese vocabulary learning autonomy?

For the questions of perspectives competing with oneself and with peers when playing *Quizlet* vocabulary games, 80 percent of the students stated

that they liked to beat their own records whereas 63 percent of the students would like to compete with other peers. The overarching finding for research question two was that the game competition features of *Quizlet* motivated the students to study more and set a higher bar for vocabulary learning. The themes that emerged were a) competition motivated learning and b) learner autonomy. The students said: "I used *Quizlet* to study so much. And I was very determined to break records in competition." "I was definitely motivated to try and beat my record and my classmates." "I aimed to have the fastest time that was fast enough that no one could beat it from the class." "I enjoy the *Quizlet* live because it channels my competitive spirit into learning. I do have a tendency to try and beat my scores." "I loved beating my high scores and getting to the top of the leader boards." In addition to these comments, some students stated that winning in the vocabulary game competition made them feel rewarded. A student said, "I love all of *Quizlet*, especially the Gravity and Live. They both give me a sense of pride whenever I beat a high score (Gravity) or my team pulls ahead (Live)."

The above comments have demonstrated the students' embrace of gamified vocabulary learning. They were motivated to beat themselves or their peers. Many mentioned that their taking action to learn more was to win in the vocabulary game competitions. The competition is, therefore, an effective pedagogical means to build learner autonomy. Through the vocabulary game competitions, the students take charge of their learning. Many set their goals and chose learning games to achieve the goals. All these learner activities reflect the characteristics of autonomous learning defined by prior research (e.g., Benson, 2001; Holec, 1981; Littlewood, 1996). Except for one required *Quizlet* learning each week, all other learning activities on *Quizlet* were done by the autonomous learners without the teacher's intervention, an ideal learning autonomy described by Dickinson (1987).

"[L]earner autonomy consists more of interdependence than independence" (Lyddon, 2016, p. 305). The online game competition among students and in-class live competition on *Quizlet* Live has formed a constructive competition environment (Sheridan & Williams, 2011), independently or interdependently. According to Sheridan and Williams, when autonomous learners are challenged by themselves or by others to work extra, they compete constructively. Constructive competition guides the learners to learn in focus. In the current study, the *Quizlet* vocabulary games have created an ideal constructive competition environment and motivated the students wanting or willing to spend extra time learning new words by stretching them a little. For example, here are some students' excerpts:

> "*Quizlet* is a great vocabulary learning tool. I think it is helpful to know one compares to the rest of the class to see if they are lagging and need to catch up or if they are learning at a good pace."

"I often found myself trying to beat my best score."

"The matching and *Quizlet* Live games were fun and helped improve the speed of my recognition of the characters, while also encouraging me to improve through the competition aspect."

"I love doing *Quizlet* games. The most fun part of *Quizlet* is how a single mistake can cause your team to start over. This made me push to always memorize the characters before and during the game. It did give me the motivation to beat others records."

Apart from the demonstrated learning autonomy through constructive competition, the students' statements about motivation to achieve higher scores in the vocabulary game competitions have demonstrated self-determination, the internalized motivation for extrinsic rewards. Such intense motivation, in turn, transforms into autonomous learning and self-determined goals:

"*Quizlet* was just all around helpful in being able to learn the vocabulary of each chapter. Flashcards and Learn are the primary tools that I used to become familiar with words for the first time. I then use scatter and test to put my knowledge to the test when I feel confident enough."

This statement clearly demonstrated the ownership and agency of this autonomous learner who has taken full charge of his weekly vocabulary learning.

The various reasons that the students learn through *Quizlet* vocabulary games or want to beat their records have exemplified the notion that L2 motivation is dynamic in the twenty-first-century language classroom. The multiple functions of *Quizlet* vocabulary games have created "a motivational jet stream" (Dornyei, Muir, & Ibrahim, 2014, p. 11) that transforms individual student forward toward higher goals:

"I do all of the *Quizlet* assignments each week. I really enjoy the Match. I play it on my phone and it helps me with character recognition. I also think that Spell and Write are good for me to listen to the Pinyin and improve my pronunciation."

"I like the Live class competition the best. This motivated to be the most competitive and try extra hard to do well."

"I use often and I would spend a good 1-2 hours trying to improve my Scatter score before I submit it."

The self-determined, extrinsic rewards eventually lead to autonomous, intrinsic motivation to learn. Such intense motivational drive the students of this study have displayed in Chinese vocabulary learning is what Dornyei, Muir, and Ibrahim (2014) defined: Directed Motivational Current (DMC).

Following on this thought of learner autonomy and directed motional current, we would like to point out that, when building learner autonomy in technology-mediated, game-enhanced language learning, teacher autonomy is equally important. While technology has become ubiquitous, providing access to online resources alone does not automatically lead to the development of learner autonomy (Wash, 2012). The ever-faster changing and development of technologies have created new tools and new options for the learners, which require language teachers to conceptualize the dimensions of learner autonomy and facilitate the development of learner autonomy accordingly for effective learning and teaching.

Furthermore, in the twenty-first-century classroom, language learner motivations are dynamic and new technologies bring in new educational technologies. Amid the dynamic motivational current and emerging technologies, as Waninge, de Bot, and Dornyei (2014) pointed out, it is possible for the language teacher to direct the motivational current in language instruction. An autonomous teacher who is capable of utilizing and managing the CALL classroom (Kessler, 2010) can facilitate and direct the motivational current of the classroom for both short- and long-term learning. Students guided by an autonomous teacher are engineered to build autonomous learning skills and achieve their full potential through the deployment of sustained, facilitative structure (Doiz, Lasagabaster, & Sierra, 2014).

The pedagogical design introduced in this chapter has demonstrated that it is possible for teachers to take advantage of digital vocabulary games to facilitate and build student learning autonomy in CFL classroom. The positive feedback from the students testifies to turning internalized, extrinsic rewards in game competition into sustained intrinsic motivation.

CONCLUSION

The advent and wide use of technology revolutionize the concept of learning and enable learning to happen not only in the classroom. In this chapter, we have shared a pedagogical design utilizing digital vocabulary games on the *Quizlet* website. Guided by the DMC model, the current study shows the positive and great learner autonomy in CFL vocabulary learning through a game-based multiplayer language classroom. It has illustrated how the teacher directed the dynamic motivational current and built language learner autonomy in the CFL classroom. The two research questions have helped understand how internet-based vocabulary games can promote learner autonomy in Chinese vocabulary learning, the extent gamified vocabulary tools can help with CFL vocabulary instruction, and student perspectives on the digital game competition. We conclude that (1) Web 2.0 tools such as *Quizlet* vocabulary competition make

learning the multiple facets (i.e., meaning, shape, phonetics, and typing) of Chinese vocabulary effective. (2) The instructor is crucial in directing the dynamic motivational current to achieve various instructional purposes when teaching Chinese vocabulary with *Quizlet* games. (3) With the combined use of DMC model and Web 2.0 tools, students are driven to best themselves in vocabulary learning, pushing them to exceed expectations.

Although it is not intended to generalize the pedagogical results and approach of the current study, the students' Chinese vocabulary learning and satisfaction in using vocabulary game competitions indicate that the use of digital games in CFL vocabulary instruction is "the correct condition" that "allows motivational pathways to be created" (Dornyei, Muir, & Ibrahim, 2014, p. 11). The fact that students wanting and willing to spend time improving competition records at their own pace is actually a motivator to autonomous learning.

There is scant research in qualitative SLA research on game-based vocabulary learning (Yamamoto, 2014) with real students in intact classrooms (Nunan, 1991; Spada, 2005). The unique feature of this study has filled a gap in both game-mediated vocabulary learning research and instructed SLA research. Although no one could acquire a language without learning vocabulary, research in vocabulary learning is the least studied areas in SLA literature (Laufer, 1986). This study has provided pedagogical evidence and reported how the online *Quizlet* vocabulary game competition works as a motivator to achieve day-to-day instructional goals in the CFL classroom. Unlike the experimental, classroom-oriented research whose laboratory methodologies and treatments are difficult for practitioners to adopt (Spada, 2005), the current study is a genuine classroom-based one and the pedagogical design and approaches of building language learner autonomy are easy to understand or to adapt for practitioners' own uses.

Moreover, autonomy research has a less significant impact on North American language education, compared to that of sociocultural theory (Benson, 2006). Yet, to our knowledge, most published language learner autonomy research is on English as a foreign/second language. The current research about learner autonomy and gamified Chinese vocabulary learning is one of the few. However, it is inevitable to have limitations. The first is, the data were collected through natural classrooms whose participants were defaulted by course registrations. It was beyond our control to balance learner background (e.g., zero beginners and learners with short prior Chinese education) and learning styles (e.g., visual or audio learners) in each class. The second limitation is the lack of survey for student learning styles before class. Not every student likes game competition in vocabulary learning. Language teachers need to be aware of the diversity of learning styles and supplement with other technological tools other than *Quizlet* alone. A language learning

history or learning style survey might be suggestive when the teacher decides when to use what features of the *Quizlet* game for assessment.

Last but not least, teacher autonomy is a largely neglected topic in autonomy research. As we discussed earlier, teacher autonomy is extremely important in facilitating and developing learner autonomy. Levels of learner autonomy are associated with the effects of instruction. We echo Kessler (2010) that both in-service and pre-service language teachers need to be aware of the competence needed for an autonomous teacher to utilize, create, and manage technology-enhanced language classroom. The reason is that "future inquiry and practice into technology-mediated learner autonomy will need to be increasingly aligned to the tools, settings, and activities that are of significance to language learners" (Reinders & White, 2016, p. 151). Teacher knowledge and teacher training in both technologies and motivation theory are a must for facilitating and growing language learner autonomy.

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Chapter 3

Use Reflective Learning Model to Assess the Effectiveness of Online Language Learning

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The world is changing rapidly, our lives are connected and associated with the global communities, and communication is at our fingertips. The transformation has impacted the ways of learning, teaching, and assessing teaching and learning effectiveness (Easton, 2010). Language learning is no longer based on grammar, memorization, and drill because students are eager to learn only when the learning experience is meaningful. Current trends of language education reflect not only on pedagogy, being more learner centered, collaborative, and more technology driven, but also on geographical and physical boundaries, rapidly expanding online learning (Easton, 2010). However, professional development and current research involved in the implementation and delivery of online language curriculum must continue to grow in order to catch up with the rapidly expanding needs of online language learning.

The major pedagogical concern for delivering a fully online course is the lack of participation in discussions and limited availability and supports from teachers (Williams, 2002). Current literature suggests that the nature of student support, professional staff development, and content-based material development needs to be addressed while implementing an online program (Hicks, Reid, & George, 2001; Williams, 2002). Although pedagogically defensible teaching activities are primary concerns, stakeholders have an increasing interest in implementing online language curriculum in the world language program in order to fulfill current trends and high demands. Predominant theories in second language acquisition (SLA) stress the importance of providing comprehensible input, using communicative approaches, and providing timely feedback in daily language classrooms, which is particularly vital for enhancing second language (L2) learners' oral proficiency skills. The effects of world language instructions are often evaluated by how

much input L2 learners receive and how much language L2 language learners produce during classroom instruction.

Although there is extensive literature about the effectiveness of e-learning experiences, the focus of the literature is on computer-assisted or blended language learning models (e.g., Burdermann, 2015; Shih, 2010; Smith & Craig, 2013), and little or no empirical studies have been done to investigate a fully online language courses. Furthermore, most research on e-learning has been conducted at higher education institutes; little is known about how online world languages were implemented or about the effects of teaching and learning in public school systems. To correct the gap, this chapter aims to explore how to provide secondary school students with meaningful online language learning experiences in the academic setting.

RATIONALE: MEANINGFUL ONLINE LANGUAGE CURRICULUM

This study was conducted to evaluate a fully online Chinese course adopted from a virtual school, which was offered as a pilot while the instructor was concurrently designing comprehensive online courses for one leading school district for world languages in the United States. The overarching goals for this online Chinese language program are twofold: (a) to prepare our students to be proficient in the Chinese language and culture and (b) to become a self-directed lifelong learner. This research employs a design-research methodology to evaluate the components and effects of a pilot online Chinese course. The researcher, who strove to explore an effective and systematic teaching and learning model for the Chinese language learning, seeks feedback from students to provide ongoing modifications in pedagogy and designing new online courses. This study was undertaken independently by the researcher for the purpose of personal growth and to improve the delivery of the course. It does not represent and was not directed by the school district.

The online world language program is an ideal model to educate our students to become twenty-first-century global citizens. Online education is self-paced and student centered in nature, thus requiring tremendous discipline, organization, collaboration, and problem-solving skills. The school district adopts a framework, Portrait of a Graduate, that is implemented in teaching and learning practice that can help students develop skills beyond academic skills, so that they can adapt to the rapidly changing, increasingly diverse, and interconnected world upon graduation. The portrait of a graduate is to prepare students with world-readiness skills. A well-designed online world language course is able to cultivate essential skills that will help the graduate become a communicator, collaborator, ethical and global citizen, creative and critical thinker, goal-directed, and a resilient individual.

LEARNER AUTONOMY AND REFLECTIVE PRACTICE

This study is informed by Vygotsky's sociocultural theory and is situated within the learning theories of learner autonomy and reflective practice. Due to the nature of the online courses, autonomy as a capacity to take charge of one's own learning has been widely discussed in the studies of online education (e.g., Burkeman, 2015; Kayler & Weller, 2007; Yen, Tu, Suji-Montes, & Sealander, 2016). Autonomy is usually studied as a metacognitive strategy that can cultivate independence and self-awareness during the learning process. Scholars, such as Smith and Craig (2013), used learning journals as an instructional and self-assessment tool to evaluate the effectiveness of three online asynchronous courses. The self-assessments revealed changes in metacognitive reflection and mediation processes that were related to the measure of learning. The use of metacognitive strategies can enhance learners' performance and progress in language acquisition because students are in charge of building skills and knowledge by the cycle of reflective practice, and they generate new actions and subsequent phases of learning (Smith & Craig, 2013). Meanwhile, a self-reflection practice, such as journaling, provides tangible evidence of the meaning-making process that enables the connection between past and current experience and allows learners to construct a deep understanding of the knowledge of the content area.

Responding to directed questions fosters self-awareness of learning (Brett, Forrester, & Fujita, 2009). Similarly, Vygotsky's (1978) theory of mind studies how mind and consciousness developed through the interaction and the negotiation of meaning through educational activities. The notions of thinking and learning are valuable for researchers and educators who want to study an innovative way of teaching and learning, such as e-learning (Rubtsov & Margolis, 1996). Vygotsky's approach provides a powerful tool to study the complexity of language teaching and learning, moving from reflectivity as an inner speech to the next level of learning once one has the capacity to bring the notions into content. Through repeated reflective activities, the notion and content are internalized, the thinking process will move to the next level, and eventually the language knowledge and strategies can be generalized in their real life.

To fill the gap in current literature in evaluating language acquisition and reflective thinking in fully online programs, the researcher seeks effective pedagogy to increase the interactions and the dialogues among students and between students and teachers for online courses. This study aimed to seek answers for the following research questions: What types of learning tasks are most meaningful and engaging for online learning? What types of learning tasks are not interesting or engaging for students? How does student feedback inform teaching?

METHODOLOGY

Research Design

This action research approach involved a cycle of fours phrases: constructing, planning action, taking action, and evaluating action (Smith & Craig, 2013). At the constructing phase, the researcher examined the curriculum adopted from the virtual schools, predicted potential questions or problems, and considered tangible outcomes that were desired from the study. The curriculum consists of eight units, and each unit has two or three cycles of learning activities. The sequence of each learning cycle is situated in three components: learning modules, assignments, and assessments. At the beginning of each learning module, students are introduced to a new topic by videos and texts. Following each learning module is a variety of learning activities that provide students with practices in listening, speaking, and writing. Like in traditional courses, there are formative and summative assessments, such as quizzes and exams. At the end of each unit, students must complete a unit reflection to conclude their learning experience. Both synchronous tasks and weekly one-hour synchronous live chats were graded.

During the planning phase, the researcher devised data collection instruments by modifying existing self-reflections and creating weekly exit tickets. The taking action phase occurred while the self-reflection matrix was developed and administered as a pedagogical tool to measure the effectiveness of various learning activities. In the evaluation phase, learning and teaching effectiveness was assess by using the self-reflection data.

Instruments

The focus of this study was to use self-reflection tools to evaluate how students were engaged in a variety of online language learning activities and to further inform the instructional design. Only the pedagogical tools that were used for reflective learning were considered for data collection. The exit tickets as a formative assessment were utilized to increase the dynamic of the classroom communications in a timely matter. The unit reflections as part of the summative assessments were designed to provide suggestions while building the curriculum and assessments. Both were equally important and were employed as the primary measurements for this study in evaluating the effectiveness of the online learning experience.

Unit Reflections

A total of eight self-reflection assessments were created for this course, one reflection for each unit. Each reflection assessment consists of eight questions: What were the most useful activities, and how did they help you? What

types of activities I did not enjoy doing, and why? What was the most boring part of the unit, and why? What am I good at? What I have not managed? What do I not understand? What area do I have difficult in? When can I learn best (hear/see/write) the word?

The process of having students responded to the end-of-the-unit reflection questionnaires on their study of each topic provided a context for making internal mental dialogue explicit (Brett, Forrester, & Fujita, 2009). Students were given time to reflect on their learning process and to be critical about the strengths and the areas in which they grew in each unit. This metacognitive process also raised students' awareness of the function of autonomy in an online learning environment (Smith & Craig, 2013). They were able to articulate and to compare and contrast among a variety of tasks that addressed various domains of the language skills, such as speaking, listening, reading, writing, and culture.

Students' responses to the reflection entries on a unit provided instructor insights from the learners' perception, understanding the positive and negative elements of the course. The instructor reviewed the students' responses to questions, such as the most helpful or most boring activities, and identified the success and shortcomings of this course, which is key to pace instructions and to build a unit module for the future course that is more learner centered and based on learners' needs.

Exit Tickets

Exit tickets were given at the end of the conference meeting, and only when students completed the exit ticket could they receive an attendance credit. Although there were some variations, the essential questions in each exit ticket included the following: List what I learned today in Chinese. How could I use today's lesson in real life? What activity has helped me learn today? What activity has helped me learn this week? What I didn't understand this week. What surprised me the most today?

The exit ticket was vital for learning because the process can be served as a note-taking and coping device during the live chats. The question guided students to summarize what they learned today and helped them become autonomous learners. The quality of the entries also reflected how the students were engaged during the class. Another question that is critical for foreign language learning is to raise learners' awareness of how to apply the content to their daily life and to connect their language learning to the real world. Because the instructor has the intention of guiding students to respond to the question as such, the instructor needed to plan learning activities based on real-world scenarios.

Although two questions in exit tickets are similar to one and another, such as, "What helped me learn today?" and "What I didn't understand today," the pedagogical purposes between weekly reflections and unit reflections are

different. The purpose of weekly exit tickets was to directly respond to the synchronous session. Furthermore, the instructor sought more frequent feedback from the students, so that timely support could be provided to address students' needs, to make adjustments to the assignments, and to pace the lessons. Most importantly, after reviewing student feedback, the instructor could respond to questions during the synchronous meeting during the following week or by email.

Procedure

Data Collection

Data were collected over one school year from one online Chinese course that consisted of fourteen students who were a mixture of students in middle school and high school: seventh, eighth, nineth, tenth, eleventh, and twelveth grades (n = 1, n = 4, n = 4, n = 1, n = 1, n = 4). One-third of the students had limited knowledge of Chinese, having learned in another country or other school district. However, they admitted that they had not retained much of the language. One student expressed her intention of taking an online course because she wanted to improve her computer literacy while learning a foreign language.

Students who were enrolled in this pilot course were self-motivated to take a Chinese online course. The students had no prior experience taking any online course. The reasons they chose to enroll in Chinese 1 online were because the Chinese course was not offered in their base schools or because Chinese 1 did not fit their schedule. Only one seventh grader needed to obtain special permission to register for the course. Only two students were identified as heritage speakers, and both spoke Chinese Mandarin fluently; one of the two students was in middle school, the other, high school. All students were from culturally and linguistically diverse backgrounds. Eight ethnicities were represented in this class.

Data were collected from reflection entries for eight units and exit ticket entries for twenty-six sessions of synchronous meetings. There were two cycles of this action research. The first was to evaluate the pedagogy tools. During this cycle, the researcher conducted a preliminary examination of the data by the end of the first unit based on exit tickets and reflection entries. At the early stage, the results from the exit tickets were found to be similar to the unit reflections. Based on the questions, students were led to reflect on the experience of the weekly learning activities, so their responses were most likely related to the asynchronous learning activities in the weekly learning modules, which were built into the adopted virtual school curriculum. Although this part of the data informed the research of their perception of the curriculum that would be used to improve the design of the curriculum, their responses became repetitive and too general and therefore could not provide

enough insights to the instructor for improving instructional design on the weekly live chats. The researcher realized a need to modify the guided questions in the exit tickets, which made it necessary for the researcher to collect more specific information on learning that would become recommendations for making adjustments for teaching and developing courses.

Therefore, some adjustments were made to the exit tickets at the beginning of the second semester, which was the fourteenth synchronous meeting. There was an additional question, "What activity has helped me learn today?" which was aimed to differentiate from the question, "What activity has helped me learn this week?" Although some students did not recognize the differences, most of the students provided feedback on synchronous activities and asynchronous tasks within the same entry. The researcher added one or two content- or culture-related questions to each exit ticket that required attention and participation during the live chats, such as "今天是谁的生日?" which translates to "Whose birthday is today?" and "我们班最多什么属相?" which translates to "Which zodiac is the most common among the students in our class?" These modifications of the exit tickets led to more insightful responses in learners' entries.

Coding

To perform manageable data analyses, only the following items in both reflection assessment were coded, "the helpful tasks" and the "nonenjoyable tasks," to evaluate the effectiveness of asynchronous and synchronous learning tasks in this online Chinese course. The learning tasks that occurred in the data sets were coded into ten categories: speaking assignments; video or audio learning tasks; language structure learning modules; assignments that involved vocabulary and language structure practices; culture activities; writing assignments, including essay or constructions of sentences within content; live interactions; live instructions; projects; and tests.

DATA ANALYSES

The occurrence of types of activities logged in students' self-reflection data determined the effectiveness of a variety of learning activities. To answer research Questions 1 and 2—"What types of learning tasks are most/least meaningful and engaging for students"—quantitative data were used to inform the qualitative changes in responses and instructional delivery, which can answer research Question 3—"How does student feedback inform teaching?"

To understand the overall interactions between online learning tasks and how students' reflections impacted the instructor's pedagogical decisions,

one multivariate analysis of variance (MANOVA) test was performed based on the eight units of self-reflection data. A two-way and several one one-way Analysis of Variance (ANOVA) tests were performed based on twenty-six weeks of exit ticket entries.

Analyses of Self-Reflections

To address Research Questions 1 and 2, the types of learning tasks that are most/least meaningful and engaging for students, a one-way MANOVA was conducted to test if there would be one or more mean differences between student feeling (helpful and not enjoyable) and ten types of learning tasks. There was a significant main effect on the feeling of engagement toward types of learning tasks, $F(13,138) = 3.94$, $p < .005$, *Wilks'* $\Lambda = .436$, partial $\eta^2 = .34$. A statistical significance was observed in the simple effect between helpful activities, $F(9,70) = 6.28$, $p < .005$, and between no enjoyable activities $F(9,70) = 2.93$, $p \leq .005$.

Statistically significant differences in interactions between helpful activities and between nonenjoyable activities that were confirmed by post hoc analyses were reported as the following: First, the most helpful learning tasks based on self-reflection entries by the end of each unit were the learning module activities ($M = 2.38$, $SD = 2.00$), followed by synchronous interactions ($M = 2.25$, $SD = 1.17$) and speaking activities ($M = 2.13$, $SD = 1.96$), which had significantly more tokens than assignments ($M = .75$, $SD = .46$) and culture activity ($M = .25$, $SD = .46$) by $p < .05$. Among the nonenjoyable activities, post hoc analyses also indicated that the learning module was the nonenjoyable or the most boring activity ($M = 1.50$, $SD = 1.60$), followed by listening tasks ($M = 1.25$, $SD = 1.28$) and assignments ($M = 1.25$, $SD = 1.04$), which had significantly more tokens than synchronous interaction ($M = .63$, $SD = 1.06$). In self-reflection entries, there were zero tokens within the categories of synchronous lecture, projects, and tests. Therefore, any interaction with these three categories was not reported.

Some tasks were highly rated for both helpful and nonenjoyable, such as learning module activities. To compare the interactions between helpful and nonenjoyable within a learning task, ten independent samples *t*-tests were computed to compare the tokens of each type of learning task in most helpful and nonenjoyable categories. Among ten types of learning tasks, statistical significances were found in the speaking tasks, writing tasks, and synchronous interactions when comparing students' ratings of the most helpful activity and the nonenjoyable activity. These results suggest that according to the self-reflections in eight units, more students considered speaking tasks as the most helpful activity ($M = 2.13$, $SD = 1.96$) than those who considered speaking as a nonenjoyable activity ($M = .63$, $SD = .74$), $t(9) = 2.02$, $p < 0.05$.

Moreover, students who thought writing was the most helpful activity during the week ($M = 1.75$, $SD = 1.17$) were statistically more significant than those who thought writing was the nonenjoyable activity of the week ($M = .75$, $SD = .89$), $t(13) = 1.93$, $p < 0.05$. The tokens of considering synchronous interactions to be the most helpful activity of the week ($M = 2.25$, $SD = 1.17$) were significantly higher than those of considering synchronous interactions as a nonenjoyable activity of the week ($M = .62$, $SD = 1.17$), $t(9) = 2.02$, $p < 0.05$.

Analyses of Exit Tickets

Students' Perceptions of Most Helpful Activities

A two-way ANOVA was computed on twenty-six weeks of exit tickets to examine the effect of ten types of online learning tasks and of eight units on students' feeling of engagements. Figure 3.1 demonstrates mean tokens of students' perceptions of the most helpful activities that have been found in weekly exit tickets (N = 26). There was a significant interaction between students' feeling on types of learning tasks across units, $F(63, 180) = 2.27$, $p < .000$.

Post hoc analyses using Tukey's HSD indicated that synchronous interaction ($M = 6.27$) had significantly more tokens when students responded that it was the most helpful activity of the week when compared to the other nine types of learning tasks at $p < .05$. Tukey's HSD post hoc analyses also revealed that speaking activity ($M = 3.96$) had statistically significant more tokens than most activities at $p < .05$, such as instructional modules ($M = 1.62$), culture activities ($M = .58$), writing/essay ($M = 1$), synchronous lectures ($M = 1.85$), projects ($M = .42$), and tests ($M = .50$). Tukey's HSD post hoc tests suggested that assignment ($M = 2.81$) was significantly more helpful than tasks at $p < .05$, such as culture, writing/essay, and test. Listening activity ($M = 2.31$) also was significantly more helpful than project and test at $p < .05$.

Effective Activities across Units

A series of one-way ANOVA tests was conducted to compare mean differences within each type of tasks cross eight units. Statistical effects were found in instructional modules, $F(7, 18) = 4.10$, $p < .05$, synchronous interactions, $F(7, 18) = 4.24$, $p < .05$, synchronous lectures $F(7, 18) = 5.54$, $p < .05$, and projects $F(7, 18) = 3.78$, $p < .05$.

As in figure 3.2, post hoc analyses using Tukey's HSD indicated that within instructional module category, unit 8 ($M = 3.33$) had more learners rated as the most helpful activity of the week, which was a significantly higher rating than unit 4 ($M = 1.50$), unit 5 ($M = .67$), and unit 7 ($M = .33$) at $p < .05$. As in figure 3.3, within the category of synchronous interaction, Tukey's HSD

post hoc tests confirmed that students considered synchronous interaction as the most helpful learning activity, especially in unit 6 at $p < .05$. Statistically significant differences were found between unit 6 ($M = 12.33$) and the other units, except for the second-highest-rated unit 7 ($M = 8.67$). In unit 7, significantly more tokens were found in synchronous interaction than in unit 1 ($M = 3.33$) and unit 8 ($M = 3.00$). Tukey's HSD post hoc analyses indicated that there was a significantly increasing value of synchronous lecture tasks starting at unit 3 ($M = 2.50$). There was a peak during unit 4 ($M = 3.25$) and unit 5 ($M = 3.33$), and then unit 6 ($M = 2.67$).

As in figure 3.4, from units 3 to 7, the recognitions of synchronous lecture being helpful were significantly higher than unit 1 ($M = .17$) and unit 2 ($M = .50$) at $p < .05$. The mean of rating synchronous lecture as a helpful activity in unit 8 ($M = 1.33$) was significantly less from unit 4 to 6 at $p < .05$, while the mean in unit 7 ($M = 2.00$) was less than unit 4 and unit 5. Finally as in figure 3.5, the post hoc analyses by Tukey's HSD suggested that the mean of rating project as a helpful activity ($M = 1.67$) was significantly higher than the other tasks at $p < .50$, except for unit 3 ($M = 1.00$).

RESULTS

Effectiveness of Online Learning Tasks

In this study, the effectiveness of online learning tasks was determined by the findings that addressed the research questions: What types of learning tasks are most meaningful and engaging for online learning? What types of learning tasks are least interesting or engaging for students? The tokens coded from the responses to guided questions in self-reflection and exit tickets, "What were the most useful activities?" and "How did they help you?" were used to determine how students were engaged in various online learning tasks and how one type of learning task is more effective than another. On the other hand, the tokens coded from questions, "What were the types of activities I did not enjoy doing, and why?" were used to determine the type of learning tasks that were less engaging and less effective.

Figures 3.6 and 3.7 demonstrate mean differences in helpful activities and nonenjoyable activities in self-reflections and exit tickets. In figure 3.7, the summary of the ratings of helpful and nonenjoyable activities from quantitative analyses demonstrated some cohesion and contradiction.

Figure 3.8 demonstrates hierarchical ratings of tasks among three rating categories: helpful in self-reflections, nonenjoyable in self-reflections, and helpful in exit tickets. Synchronous interaction and speaking activities were consistently rated at the top of helpful activities in both self-reflections and

exit tickets, which were also confirmed by the *t*-tests that they were at the bottom of nonenjoyable activities. Most students thought the speaking activities provided them opportunities to practice, and they also highly valued the feedback from the instructor, which helped them improve their pronunciations.

The primary contradictory in ratings was found in the category of learning modules, and then in the category of assignments. When students reflected on their learning and while reviewing the content in each unit, they often found that learning modules were always available. However, they also found learning modules boring and not engaging. Similarly, assignments were among nonenjoyable learning tasks. Students found the assignments boring, but they acknowledged the importance of practices while they reflected in their weekly exit tickets. Interestingly enough, writing essays or the application of writing sentences were among the most helpful learning tasks in students' self-reflection entries, yet writing essays and writing sentences were underrated in the weekly exit tickets.

The listening tasks were listed on top of three rating categories. Students acknowledged the helpfulness of the listening activities in the online course. On the other hand, many of the students said the videos bored them. In the students' self-reflections, some students thought the videos were helpful when they were learning pinyin. Most students who did not like the listening activity indicated that the pronunciation videos were repetitive although few students found them helpful. Many students found the conversation videos fun to watch and helped them conceptualize the text, while some students found them boring.

Initial Phase of Changes

The evaluation of learning effectiveness became the instructor's reflection on his or her teaching and on the curriculum. Students' feedback had informed the instructor's pedagogical decisions in two different ways. While exit tickets were the formative assessments to provide teachers qualitative evaluation on students' weekly performance, unit self-reflections were the summative assessments that allowed students and the instructor to check for learners' understanding of the content in a holistic way.

For the instructor, the review of exit tickets was the most effective way to address students' individual needs. The instructor made two primary modifications, based on the feedback in the exit tickets, during the early stage of the school year. The pronominal modification was at the pedagogical level. During the early stage, the instructor read from the exit tickets and unit reflection about how students benefitted from the interactions during the synchronous meetings and the asynchronous activities. Students strove to improve their speaking while taking the online course. Synchronous sessions were the only

time that the students could practice and the instructor could check their understanding in real time. Students highly valued the instant feedback from the instructor and other students during the lessons. The instructor aimed to maximize student interaction and opportunities to enhance their oral proficiency level during one hour of the class period.

During the beginning of the semester, the instructor was taking an online teaching course and benefited from being more comfortable tackling breakout rooms for small group activities. Students' value of the transformation from large-group dominated to small-group discussions facilitated during the synchronous sessions was reflected in the exit tickets. Figures 3.4 shows that the numbers of tokens for synchronous lecture as the most helpful activities increased dramatically, starting at unit 3, the beginning of the second quarter.

Another modification was to create additional individualized questions in exit tickets, so that the instructor could collect more evidence that students were engaged during the synchronous lesson and to create more inclusive classroom dynamics. For instance, the instructor would ask students one specific question, such as "What did student A eat for dinner yesterday?" that required that students fully participate in the classroom activity. This type of question not only made the students more attentive during the class, but they also got to know their classmates better.

Second Phase of Changes

While the course progressed to unit 6, the instructor created other structured breakout room activities, such as complete worksheets while interviewing the small-group members. This type of activity not only scaffolds students' interpersonal communications but reinforces metacognitions and collaboration. This transformation boosted the rates of synchronous interactions in exit tickets, as shown in figure 3.3, which also showed a decrease in the rate of synchronous lectures, as in figure 3.4. Students experienced the dynamics of the virtual classes and expressed their highest interests in meaningful small-group and large-group interactions rather than reviewing content during large-group discussions.

Another observation of the students' reflection on writing encouraged the instructor to implement additional interactive writing activities. As discussed earlier, there was a statically significant effect between writing as a helpful activity and as a nonenjoyable activity. The instructor delivered the writing activity as a dynamic conversation during the synchronous and asynchronous tasks. Through the discussions of students' writing samples and utilizing Google Docs to create dialogues between students and instructor, students developed writing techniques and organization skills by building language structures into content. The process of negotiated word meaning made the

writing process meaningful. Thus, near the end of the year, more students reflected on the writing activity as a helpful learning task because the process helped them apply their language learning into real-life scenarios.

CONCLUSION

This action research used reflective practice as a means to empower student autonomy and the instructor's growth as an educator. The reflective practice originated from Dewey's (1933) learning from doing, and what he believes that the reflective action started as conscious and caution. This study represented an interconnectedness of the cognitive and the social processes. Vygotsky's (1963) theory in thought and language is reflected in the findings of this study that students developed deep understanding of the language learning process through developing notions as independent learners as well as through meaningful learning activities, where they were provided ample opportunity to internalize the language and content and to interact with peers and with the instructor.

The instructor also grew through social practices. Reflective practices enable educators to explore how a variety of tools creates a mediational space in which the instructor and the students can internalize and externalize the current understanding (Johnson & Golombek, 2003). The notion of this social practice can help the instructor shape learning and teaching and can further reconceptualize and recontextualize their understanding in order to develop new ways to engage the students and the instructor in meaningful activities (Johnson & Golombek, 2003).

The current study provided educational implications in several scopes. First, self-reflections shaped students as self-regulated learners by instilling autonomy during online learning and internalized their language learning process, which are essential to gain the skills of successful world-readiness. Second, the reflections offer nonverbal dialogues within learners and instructors and between students and the instructor that provide them with the ability to make adjustments in their learning and teaching strategies.

Third, this study provides evidence that implementing alternative formative and summative assessments is as important as traditional assessments. While most of the instructional plans were informed and modified according to exit tickets as a formative assessment in a timely fashion to address students' needs and to provide individual needs, unit reflections as a summative assessment offered the instructor the opportunity to evaluate the course through a systematic and nonbiased lens. In particular, although students considered some activities nonenjoyable, by the end of the course, they realized the importance of learning a language from a variety of approaches to help them

strengthen all aspects of language skills. Increased ratings of learning modules, writing, and projects revealed evidence that students eventually valued practice through a systematic curriculum that offered diverse asynchronous and synchronous activities that helped them succeed in acquiring a foreign language. This notion was especially found in highly performing students, based on comments such as, "I found all activities helpful, even though some activities were not very engaging. I know they help me practice."

Other comments: "I like this week's activity because it was more interactive"; "I don't like the practices/audios because they are not interactive"; "I like writing because it helps me apply what I learn to the real situation." Such comments best described that what students wanted was a full range of learning tasks to help them practice all domains of language skills that are interactive, engaging, and enable them to put language learning into meaningful content. Such feedback was what the researcher, as an instructor and curriculum developer, internalized and externalized during the course of future development.

Building on the findings from the current study, a follow-up study can further examine how the quality of self-reflection is related to learner performance. Further research also could compare the different quality of responses between using direct prompt questions (e.g., what is your favorite learning activity?) and generic questions (e.g., I wish I could . . .), and how these two types of question inform teaching and learning (e.g., Davis, 2003; Choi, Walters, & Hoge, 2017). For instance, the responses that the instructor enjoyed reading the most were to the question, "我觉得很意外的是," which translates to "The thing that surprised me the most was . . ." This type of question fostered many interesting responses that provided the instructor with more insightful information on students' perceptions of language, culture, social life, and transformation of learning.

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Chapter 4

Empirical Studies of Teletandem between U.S. and Taiwan Universities

Yan Gao and I-Ping P. Fu

The Chinese language is the most spoken language in the world (Ayancan, 2018). There are over 1.3 billion Chinese people in the world, which means that one in five people are Chinese. The Chinese language is also ranked as a Level Five language by the United States Defense Language Institute (Foreign service institute language difficulty rankings, 2018). This scale ranks language acquisition difficulty between one and five, with five being the most difficult. Most European languages fall toward the lower end of the scale, implying that the Chinese language is one of the most difficult languages to learn. Despite the difficulties inherent in learning the Chinese language, a College Board internal study in April 2008 showed that growth of Chinese language programs in K–12 schools in the United States has increased by 200 percent since 2004. Also, the enrollment in Chinese classes on college campuses had risen 79 percent between 2002 and 2013. All the European languages such as French, German, Spanish, and Latin, on the other hand, had experienced declining enrollment (MLA, 218).

The difficulty in learning Chinese is compounded by the fact that not every university is surrounded by a big Chinese community to allow students to practice the language and be exposed to the culture. Furthermore, study abroad programs are costly and can be intimidating for some language learners. Most Chinese language teachers realize these difficulties and are looking for new and innovative ways to engage the increasing number of American students eager to learn the language. In recent years, online courses and social media have given students the opportunity to learn through video interaction. During the 2004–2005 school year, 506,950 K–12 students in schools throughout the United States were enrolled in online distance education courses (Zandberg & Lewis, 2008). It is estimated that this number increased to 2.2 million K–12 students by the 2014–2015 school year.

Teletandem is a learning tool that utilizes online webcam technology such as Skype, Google Hangout, and Zoom to allow for telecollaboration between students from two countries. For the past two decades, other foreign languages such as French, German, and Spanish have been utilizing Teletandem to deliver language learning between students in different countries. There is very little research available about the effectiveness of Teletandem when used between American and native Chinese students. It was our desire to examine how Teletandem affects American students' ability to learn a complicated language like Chinese when paired with students in Taiwan.

LITERATURE REVIEW

Teletandem and Telecollaboration have been used interchangeably in the literature for the past two decades. Most of the research on Teletandem or Telecollaboration has been conducted in languages other than Chinese (Belz, 2003; Belz & Thorne, 2006; Kern, Ware, & Warschauer, 2004; Lee, 2011; Spinelli & Dolci, 2007; Vinagre, 2005; Vinagre & Lera, 2008; Vinagre & Muñoz, 2011; Ware & Kramsch, 2005; Ware & O'Dowd, 2008).

Limited research has been published on using Teletandem to teach Chinese language and culture. Jin (2013) notes the interest in teaching Chinese using telecollaboration between American students learning Chinese and native Chinese speakers. Jin highlights, however, the lack of research on intercultural telecollaboration between English-speaking learners of Mandarin Chinese and native speakers. In order to prepare American students to be global citizens, classroom teaching and traditional pedagogical methods are not sufficient (Byram & Feng, 2004).

Gardner (2006) expanded Dornyei's (1996) theory of language learning motivation to include not only the drive to acquire a new language, but also the learner's attitude in approaching new language acquisition. Thus, a student's internal motivation to learn a new language can be influenced, according to Gardner's social-educational model theory, by self-regulation. Several recent studies of college and university students have shown that self-regulated learning is a crucial factor in students' success in online courses (Barnard et al., 2009). As students' motivations shift from external behavioral feedback (i.e., failure to attend lab time weekly leading to grade reductions) to internal motivational factors, then self-regulatory skills can become more personal and strengthened (Zimmerman & Schunk, 2001).

According to Moore (1993), learner autonomy is "the extent to which in the teaching/learning relationship it is the learner rather than the teacher who determines the goals, the learning experiences, and the evaluation of decisions. . ." (p. 31). Howland and Moore (2002) developed this thought further,

showing that with online courses in particular, self-regulation appears to be of utmost importance in achieving positive student outcomes.

Fisher and Baird's (2005) qualitative research of online course curriculum and instruction has confirmed that once students formed a positive sense of community, they would continue for two years in sequential coursework. This research suggests that self-regulation is not sufficient for strengthening learning without a sense of community positively influencing student retention. The natural curiosity that students have regarding other cultures and like-minded peers, combined with their need for social acceptance and desirability by others, combines to produce a powerful intrinsic motivator.

RESEARCH QUESTIONS

(1) Is Teletandem an effective method to facilitate and motivate students' learning of Chinese language and culture?
(2) How does Teletandem affect American students' Chinese language acquisition in post-secondary education?
(3) What does Teletandem accomplish beyond students' language acquisition?

METHODOLOGY

Over the past decade, many research studies on the use of Teletandem for the acquisition of foreign languages have used qualitative and interpretive case studies (Salomão, 2011a, 2011b). The qualitative research method helps us gain an understanding of underlying reasons, opinions, and motivations. It reveals the trends in thoughts and provides a deeper understanding of answers to our research questions than quantitative research alone may provide. The quantitative research method provides usable statistics that quantify attitudes, opinions, behaviors, and other defined variables. This method helps us generalize results from our sample population. We chose to use a mixture of qualitative and quantitative methods in this research.

PARTICIPANTS

This research was conducted under institutional context (institutional tandem) (Vassallo & Telles, 2006), which meant students had to enroll in the courses at both universities. The American public university is located in the eastern part of the United States and the private university in Taiwan is

located in the southern part of Taiwan. One hundred and eight student participants were enrolled in the American university and their data were collected for this research. These were the students who enrolled in at least one year of Chinese 201 or 202 between 2013 and 2017, except 2015. The students' ages ranged from eighteen to twenty-four years old. Students from both the American (fifty-five females and fifty-three males) and Taiwanese groups (ninety-nine females and nine males) were predominantly females. American student participants were majoring in diverse fields, like international studies, Asian studies, business, arts, math, pre-medical, etc. Student participants from Taiwan, however, were majoring in either Chinese or English. American students were requested to take an interest survey the first week of the semester to inform teachers of their special requests for partners. Teachers of the two universities then paired students according to their mutual interests.

THE PROCEDURE OF TELETANDEM

Once students were paired, they interacted one on one for an hour per week. The students' main task was to communicate orally in a synchronous Teletandem learning exchange. They utilized Skype or other video chat tools for synchronous interaction and used Google Docs or blogs for asynchronous communication. Chinese 201 and 202 students each had a list of topics that coincided with course materials (table 4.1). Topics for intercultural exchange were designed by the researchers according to the textbook content: *Chinese Link* published by Pearson Education (2011). The online interactional activities were integrated into the formal Chinese curriculum for American students. During each Teletandem session, students were allowed to talk about their interests after they finished the required topic discussion.

As teachers/researchers promoted the development of students' linguistic skills and intercultural competence through the Teletandem exchange, students focused on improving their communication skills through the exchange of information about their lives, cultures, and areas of study. Our Teletandem followed the three main principles: languages must not be mixed, reciprocity, and autonomy (Vassallo & Telles, 2006). In each Teletandem session, students negotiated meaning, exchanged information, spoke in the target language, and helped their partners practice the target language acting as mentors or instructors (Little & Brammerts, 1996; Vassallo & Telles, 2006). Students' completion of their Teletandem sessions contributed toward their final course grades.

Students in Chinese 201 and 202 had a different set of topics reflecting the course material (table 4.1). Topics in the Chinese courses focused on preparing for a study abroad trip to China. Topics for the English courses reflected

teaching Chinese as a second language, English literature, and American cultural themes. During each session students were allowed to talk about their personal interests after they finished the required topic discussion. All students needed to add their partner through their own Skype account in order to prepare for the first Teletandem session. The instructors offered training sessions to explain the project guidelines, assign partners, demonstrate the use of blogs, explain the grading criteria, establish meeting times, dates and topics for each session, and how to brainstorm ideas related to the topics.

The American students met on campus at the language labs, while the Taiwanese students met at their homes or dorms. Students initially established contact by synchronous communication that lasted sixty minutes. Instructors provided students with information about how initial sessions were to be conducted and what vocabulary was to be used. The Language Lab coordinator gave technical support as needed. Feedback, comments, surveys, and interviews were collected and analyzed at the end of all sessions.

DATA COLLECTION

Data were collected from 108 participants through an online questionnaire after they had completed all eight weeks of teletandem practice. The online questionnaire consisted of nine questions (see tables 4.2a and 4.2b). We chose to look at two main phenomena from the quantitative perspective of Teletandem, which are effectiveness and motivation. These nine items were used in the survey to measure effectiveness and motivation. They were rated on a five-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = neutral, 4 = agree; and 5 = strongly agree). The questionnaire was powered by Surveymonkey and Google Forms. Apart from the independent and dependent variables, a total of five items comprising demographic variables like gender, age, academic major, language at home, and lived abroad were also captured. These demographic details were used for profiling the sample participants.

The format and sequence of questionnaire items were suitably arranged to reduce the common method bias in the responses as far as possible. Focus group interviews were also used as a qualitative approach to gain in-depth understanding of Teletandem from the students' learning perspective. The interviews allowed us to see the reactions to learning Chinese language and culture using Teletandem. Analysis followed both quantitative and qualitative interpretive procedures. The focus group interview, in which the students could express themselves freely about their Teletandem experiences, was analyzed from the perspective of qualitative-interpretive approaches (thematization and categorization). They were then contrasted with the quantitative questions for possible insights.

FINDINGS AND DATA ANALYSIS

We used the Wilcoxon rank-sum test to examine two independent samples, which were unmatched data from populations of Chinese 201 and 202 classes. If the answers of two groups were different under Wilcoxon rank-sum and median testings, there would be significant differences between the answers from the two groups. There were no significant differences between the answers from two groups. Since the value was bigger than 0.1, it was very likely these two samples were from the same population of students (see table 4.3). This provided strong positive impact of the online partner program which was consistent in both levels of classes. In the following section, we organized our findings according to our research questions:

(1) The *effectiveness* of Teletandem based on students' personal responses to the Teletandem context;
(2) The *motivation* that American students had demonstrated by Teletandem in Chinese language acquisition; and
(3) The *accomplishment* of Teletandem beyond students' language acquisition

First, we will report the quantitative results of the questionnaire. Then, we will present the analysis of the qualitative results.

The effectiveness of Teletandem was almost unanimously positive, 89.6 percent (41.0 percent + 48.6 percent) of students indicated that Teletandem enhanced their language learning experiences (figure 4.1). The following are representative student responses:

> "Yeah it's definitely beneficial, especially in a foreign language class. I think it could be used in every foreign language class. If you're learning about any different language or culture, I think that actual interacting with somebody from that culture is a great way to accelerate your learning. And also, doing it over the internet makes it so much more accessible to everybody. You don't have to actually have somebody come from other country to visit you, or you go to another country to meet them. You can actually talk to each other, just through the internet which is really nice. It makes it much easier."

> "Just in talking to somebody that like, lives in a different culture that they're not on a script. They just talk to you about their lives, their experiences. They have a lesson plan, but then they might tell you, you know, what they're doing with their friends later, and that tells you a lot you know, that tells you what people that age do in that particular city at that particular time, you know there's a lot you can learn from the person . . ."

92.4 percent of students indicated that Teletandem did improve communicative skills in the target language (figure 4.2). A sample response is as follows:

> "You get to practice the language with somebody who's a native speaker your age, so you can feel a little more comfortable and it's just a lot more relaxed setting versus sitting in the classroom, you may be uncomfortable speaking, raising your hand, asking questions, but here you have one-on-one time with somebody your age."

92.2 percent of students indicated that their language partners are cooperative and helpful (figure 4.3). Representative responses follow:

> "Yeah, it's been really nice. It's been really helpful to have somebody our own age over on the other side of the world; somebody from our own generation. Because I think that it gives us an understanding of what other people are interested in the other parts of the world, and also, in the case of my partner, the way in which she carries herself and the way in which she speaks. It says a lot about the culture in Taiwan, and that's something that I would not find here in our university."

> "It's really great to get to talk to someone one-on-one and learn about their experiences and their culture, because they can generally give you not just a good perspective on the general culture but also what they specifically encounter, like a teacher, a student, and a young person in Taiwan."

87.1 percent of students indicated that Teletandem is an effective strategy for foreign language immersion and practice (figure 4.4). A sample student response follows:

> "With Teletandem, I felt that we had somebody teaching us one-on-one. And, in China, we couldn't even get that. I mean someone who would dedicate a whole hour to teach you, and only you. Over time, I got to know the person and he got to know me. He learned about my interests and then applied those interests to how he would teach me. I think that's really helpful."

86.5 percent of students indicate sessions were reliable (figure 4.5). Students' motivation was affected by Teletandem positively. 82.9 percent of students indicated that teletandem increased students' interest in the target language (figure 4.6). Sample student responses follow:

> "I really enjoyed it. I found it interesting to actually learn from somebody my age. And not just a teacher who's going to be older than us and not a textbook. It does give more cultural insight because she's able to explain it a lot more versus I have to spend all this time looking on the computer to find the answer to why something happens or what they do. She could explain it to me. And I was able to learn different vocabulary because I know that there were some words that were not from the textbook."

85.7 percent of students indicated that they learned new target culture that was not addressed during class lectures (figure 4.7). Sample student responses follow:

> "I think it was successful in doing that, I think we learned more about the culture than things we learned about in class, like grammar and vocabulary. We mainly focused on the culture, cultural differences, and stuff."
>
> "If you were learning about in the classroom, you get less general opinions that are really interesting to learn about, and you know, how they view the culture and how they view certain things, whereas I don't think you really learn as much in a textbook."

74.8 percent of students indicated that Teletandem strengthened their confidence in speaking the target language (figure 4.8). Sample student responses follow:

> "Definitely, I liked it more than a classroom because it was the way I like it. I get distracted very easily in class, so like, it's way better to work with one person. And I think I learned faster through it. And it's tailored to me, not anyone else in the class. He was only focusing on me, so that's very helpful."

74.8 percent of students indicated that their partners were interesting and engaging (figure 4.9). Sample student responses follow:

> "One thing that I found really interesting was the lesson that we took on Taboos, and things that were not acceptable in Taiwan that we just never really think about here at all. One thing was never giving a pear to your significant other because it signifies that you're breaking up with them and your relationship is ending. That's not a thing in the United States, I found that very interesting. And just a lot of the other taboos that were in that lesson I found really interesting."
>
> "It was really nice to just have someone to ask whatever sort of vocabulary I want to learn, and the lesson plans are nice. Then there's always some sort of cultural element as part of that. And then you also get the additional cultural learning when you start talking about stuff. And you hear all the funny stereotypes and things they have about Americans and what we think about them and stuff."

LIMITATIONS

Even though we have found Teletendam a valuable tool to incorporate into foreign language learning in college settings, there are limitations:

1. *Need True Administrative Support*—Teletendam needs to be supported by school administrators. It is important that the U.S. university supports instructors with virtual global classroom activities on campus. In addition, the university has to have the resources and technicians that can assist students and instructors with instructional online training videos for building Wordpress blogs, etc. On the other hand, administrators and policy makers could also make premature commitments and sign international agreements without seeking collaboration from faculty and students (Van de Water et al., 2008). Sometimes all that occurs are exploratory campus visits by high-ranking administrators. These visits may have had no impact on teacher training or student learning.
2. *Technology Limitations*—Technology can be intimidating and not all teachers are proficient in computer or webcam applications. An "unwary teacher" (O'Dowd & Ware, 2009) could get quickly overwhelmed with the complex undertaking of partnering with a foreign school to deliver Teletandem. It would be helpful for the U.S. faculty to have additional experience using an array of technologies to enhance the Chinese courses with collaborative projects that promote teamwork, but it is not always the case. Furthermore, not all technology tools are available in the world. For example, Google is prohibited in China. Thus, no teachers or students can take advantage of Teletandem through Google technology.
3. *Cultural Limitations*—Culture norms for Chinese native speaking students would limit direct feedback on an American student's linguistic errors. Even constructive feedback could be considered as losing face in Chinese culture (Pan, 2000). Teachers need to be sensitive to this limitation so they can use it as a cultural learning opportunity for both groups of Telecollaborators.

CONCLUSION

There are many programs being implemented in national and institutional contexts (from K–12 to college level) to connect classrooms through online learning activities. The benefits of virtual exchanges for foreign language classes are: development of intercultural competence (Belz & Müller-Hartmann, 2002; Blake, 2009; Levy, 2007; O'Dowd, 2007; Thorne, 2003), improvement of foreign language skills due to authentic communication with native speakers (Brammerts, 1996; Felix, 2003; Little & Brammerts, 1996; Mullen, Appel, & Shanklin, 2009; O'Dowd, 2006, 2007; O'Dowd & Ritter, 2006; O'Rourke, 2007; Schenker, 2017), increase in student motivation (Headden & McKay, 2015), and student-centered learning (Olaniran, 2009;

Dodd, 2001). In our study, U.S. students gained invaluable experience connecting with real native speakers who actually live in Taiwan.

Teletandem is a tool that may be used for international language training. The literature supports some success in the use of Teletandem with languages other than Chinese. Because Chinese is a more difficult language for Americans to acquire compared to other languages, we believe it is worth exploring whether or not Teletandem is a viable option for increasing students' acquisition of the Chinese language.

We found that Teletandem provided an authentic language immersion experience for our American students. The high-impact learning activities helped break down cultural and linguistic barriers that existed between American and Taiwanese students. In this research, we have found that the U.S. students and the students from Taiwan constructed new transcultural linkages that empowered both groups to be engaged in their learning and feel connected to the target language and culture.

The authors believe that when two paired students from Taiwan and the United States learn to appreciate each other's existence and importance to their respective societies, then a process of "humanization" was initiated. Each student sees his/her counterpart from the other culture as being important to their culture, which personalizes the relationship and the need for language learning. Global learning through learning environments like Teletandem allows students to recognize the value in all individuals and cultures, not just those with the most economic and military powers. This expanded worldview increased motivation for language learning that would not have been otherwise possible if students were focused only on receiving an acceptable grade for the course. This process of "humanization," which likely resulted from Teletandem learning, is worthy of further research as a possible cause for the learning motivation as our research showed. Brinckwirth (2012) found some evidence for the "humanization" process in his research on the use of Teletandem among students in the United States and Brazil. Students reported that they gained a more in-depth cultural understanding and that diminished some of their preconceived cultural stereotypes by using Teletandem. Students were excited to learn how much more similar their lives as college students in the United States were to their counterparts in Brazil. This same conclusion was reached by our United States–Taiwan Teletandem research.

When Teletandem is being used to acquire a new language, the motivation to learn the language may be occurring on a much more personal level than is usual in language acquisition. This strong intrinsic motivation could be similar to the intrinsic motivation people experience when communicating with a spouse or significant other who has sufficient mastery of the target language. This could be a reason why students vehemently opposed any changes to their

Teletandem learning partner between Chinese 201 and 202 classes in the U.S. university. It is the teacher's responsibility to warn the students regarding the vulnerability that they may experience with their emotional attachments to their Teletandem partners. This is especially important when students are traveling to the paired students' country to meet them. Genuine care for another student and their culture may have occurred through the Teletandem process. Ultimately, a road may be paved toward world peace one student at a time when they truly respect the value of others who differ from them. In practical career goals for a student, individuals from other cultures can sense by a student's nonverbal communication when they are truly being respected as an equally valuable human being instead of just being tolerated to achieve a personal benefit for a student.

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Chapter 5

Why and How Should Chinese Be Learned?

A Preliminary Investigation regarding Italian High School Learners

Chiara Romagnoli

INTRODUCTION

Compared to other European countries such as France, Chinese language and culture has only recently become part of the Italian high school curriculum. Statistics, however, provide an optimistic outlook for the role this subject can play in the education of Italian students (Brezzi & Lioi, 2018). While some data have been published relating to the introduction and growth of Chinese in secondary schools, research into how and why students choose to learn Chinese is still lacking. The present work aims at filling this gap by describing and discussing high school learner motivation and their favored activities with regard to learning Chinese.

The chapter is divided into six parts: the first provides an account of the growth of learning Chinese at the secondary school level in Italy, while the second illustrates the aspect of motivation in a foreign language with particular attention to studies that focus on learning Chinese. The third section presents the methodology used to collect data from a sample of high school Italian learners of Chinese, while the fourth illustrates and discusses the results. The fifth section presents some of the pedagogical implications based on our data and it is followed by the conclusion in the last part.

LEARNING CHINESE IN ITALIAN HIGH SCHOOLS: DATA AND RESOURCES

The teaching of Chinese language and culture in Italian high schools was not initially flanked by specific governmental or legislative measures: indeed, at the beginning, it was made possible thanks to the efforts of individual school principals and teachers who recognized the requests of students and families, and who were also open to accepting the occasional outside support of associations and businesses. The first courses in Chinese were launched in 2003 in Lombardy, a region in the north of Italy, and took different forms, such as three-year curricular courses of sixty teaching hours and thirty-hour elective courses. If we only consider the figures relating to that particular region, we get a general idea of the rapid growth of interest in learning Chinese on the part of secondary school students in less than a decade: the seventeen courses offered in 2003 increased to 111 just eight years later.[1]

A recent report on the internationalization of Italian schools confirms the continuing success of learning Chinese in Italy: 8 percent of secondary schools (279 institutions) in Italy provide courses in Chinese, involving almost 17,500 students. Half of the schools are located in Northern Italy, where, compared to the rest of the country, there also more curricular than extracurricular courses.[2]

The average teaching time given over to curricular courses is 3.6 hours a week, mainly taught by Italian teachers, but also partly by native speaker instructors. Since the students start learning Chinese as absolute beginners, the focus of teaching is language and the first year is mainly dedicated to the presentation and practice of the pronunciation and writing. In teaching characters and vocabulary, instructors also provide notions about Chinese culture, history, and society. At the intermediate and advanced levels, students are also presented with literary texts, idiomatic expressions, and short readings about Chinese poetry and philosophy.

There are various reasons for the great leap forward of Chinese teaching in Italy, including the implementation of the 2003/53 Reform Act and of the 2010 Rules allowing secondary schools to decide which foreign languages they can choose for their syllabus. In the same period (in 2006), the first Confucius Institute was founded in Italy at the Sapienza University of Rome: the role played by this institution should also be taken into account when explaining the success of Chinese teaching in high schools, as it has often encouraged the launch of the courses, supported them in various ways, and promoted the training of local instructors of Chinese. Another factor that influences families, and the general popularity of learning Chinese, is the hope that children will one day obtain a good job, a factor of particular importance given the alarming rate of unemployment in Italy.[3] Given this

potential, Chinese teaching has continued to grow considerably since the first courses were introduced. However, the Ministry of Education's recruitment process for instructors only officially began in 2013, ten years after the first courses in Chinese started. The possibility of obtaining a permanent teaching job in a high school is now open only to those with the necessary qualifications, which are obtained after passing the training program examination, the *Tirocinio Formativo Attivo* [Active Training Internship]. The first national selection took place in 2016 and since September 2017 the first instructors of Chinese have held permanent posts in Italian public schools. They are still limited in number, but they reflect the official introduction of Chinese into the Italian school system. Data reported in Langé (2018) show how Chinese has grown rapidly, becoming the fifth most frequently taught foreign language in Italian schools after English, French, Spanish, and German, having overtaken Russian, which has been taught in Italian high schools for almost twenty years. The term *boom*, often used in the Italian media in relation to the rapid rise of Chinese as a school subject, is therefore justified by the available data. As elsewhere, news articles link this language choice to the success of the Chinese economy and emphasize the advantages that mastery of Mandarin can have for young people.[4] This, however, contributes to a purely instrumental view of learning which can be detrimental to the image of China abroad, already dented by criticism of its political system.

A field which has certainly benefited from the introduction of Chinese in secondary schools is the publishing industry, which has responded to this growing interest with the publication of various teaching materials aimed at teenage learners. Among these, the first book was *Impariamo il cinese* [Let's learn Chinese] (2007), edited by the staff of the Institute of Oriental Studies at Sapienza University, and they recently published another handbook, *Parliamo cinese* [Let's speak Chinese] (2016): this is more detailed and more suited to school learners than the first, providing both traditional and digital resources for learning Chinese. Other didactic materials available for Italian learners are *Shuo hanyu, xie hanzi. Parla e scrivi in cinese* [Speak and write in Chinese] (2016) and *Manman lai. Corsi di lingua e cultura cinese* [Take it easy. Course in Chinese language and culture] (2016).

The challenges and problems faced by instructors in teaching Chinese at the high school level were addressed at a national congress held in Rome in 2015: on that occasion, the need to have a uniform approach to teaching Chinese in Italian schools was expressed in many quarters. The following year saw the publication of the *Sillabo della lingua cinese. Quadro di riferimento unitario per l'insegnamento della lingua cinese nella scuola secondaria di secondo grado* [Syllabus for Chinese. A single frame of reference for the teaching of Chinese in upper high school]. This document was drawn up by a group of scholars, instructors, and university professors coordinated by the Ministry of

Education, and was published on the Ministry website in 2016. The syllabus aims at providing the general guidelines for the teaching of Chinese at the high school level, providing the linguistic features, vocabulary, grammar, and culture to be covered for each year of instruction. After five years of learning, students are expected to reach an exit level equivalent to level B1 of the *Common European Framework of Reference for Languages* (CEFR), that is, level 4–5 of the *Hanyu shuiping kaoshi* (HSK) used to certify proficiency in Chinese. The syllabus lists the vocabulary required for each level, to a total of over 1,400 words. Although this initial version of the syllabus undoubtedly needs to be further tested and revised, it is the first attempt to apply standards laid down by the CEFR to Chinese, taking into account the specificities of this language. Another, very recent, step forward has been the creation of the Associazione nazionale degli insegnanti di cinese [National Association of Chinese Teachers] which will hopefully help to share ideas on the teaching of Chinese to Italian learners, and thus lead to improvements in the field.

MOTIVATION IN LEARNING CHINESE: RESEARCH AND RESULTS

Although great steps have been made to encourage the teaching of Chinese at the high school level in terms of regulations and resources, little has been done in the field of research to explore the learning motivations of Italian students. It would, however, be useful for both instructors and institutions to know the reasons why greater numbers of students are willing to enroll at schools with curricular courses in Chinese, and to discover which activities are deemed effective in learning a language that is so different to their mother tongue. The first aspect, that is learner motivation, is a much investigated topic, as confirmed by the vast body of literature available. Starting from Gardner and Lambert (1959, 1972), many other works have put forward explanations and theoretical models to investigate this complex construct, such as those provided in Gardner (1985, 2010), Ellis (2008) and Dörnyei, and Dörnyei, et al. (2006, 2010, 2011, 2012, 2013) to mention just a few.

One differentiation to be made about the construct of motivation regards intrinsic and extrinsic motivation: the first refers to the enjoyment or challenge in doing a certain activity, whereas the latter is involved whenever an activity is undertaken for external rewards or goals. The construct of intrinsic motivation (IM) has been investigated by several scholars, among them Vallerand (1997), who proposes a three-part taxonomy of IM. According to this model, the three components of IM are knowledge (the feelings linked to the exploration of new ideas and knowledge), accomplishment (sensations

relating to the achievement of a goal or the realization of a task), and stimulation (the enjoyment or fun in performing a task). Three levels can also be found for extrinsic motivation (EM), ranging from a lower to a higher extent of self-determination: external regulation, introjected regulation, and identified regulation. The first type refers to sources such as benefits or costs external to the person; the second relates to internalized pressure when carrying out a specific activity, while the third is the most self-determined and is linked to the importance attributed to a certain activity to achieve a valued goal. If no relations between activities and consequences are seen, then the condition of *amotivation* occurs (Deci & Ryan, 1985).

One strand of research in this field has taken into account the relationship between motivation and learning outcomes. Indeed, the key role played by motivation has been investigated through the meta-analysis conducted by Masgoret and Gardner (2003), which confirms the link between motivation and learning achievements.

While literature on motivation abounds, less has been accomplished in the field of Chinese, especially with regard to learning Chinese outside China or the United States. This gap has also been underlined in the book edited by Duff et al. (2013), who point out that:

> Few studies of CAL have provided an in-depth and contextualized analysis of individual learners' motivations and goals for choosing to study Chinese, their experiences and milestones in Chinese language and literacy acquisition, the social, linguistic, cultural or affective characteristics of their development, the relationship between engaging in Chinese learning and their social, cultural and linguistic identities and selves, and their longer-term trajectories as Chinese learners and users.[5]

The dearth of studies in Chinese L2 motivation has been confirmed also by Wen's (2018) recent report, which interestingly reviews the core issues and key findings in Chinese L2 motivation research. What follows outlines the main studies relating to motivation in learning Chinese in different contexts and at different levels.

Starting from the literature published in Chinese, it should be noted that studies increased in number in the 1990s in accordance with the growth of Chinese as a second language. Nevertheless, according to Tan (2015), the first accounts do not clearly distinguish motivation from goal (*dongji* and *mudi*, respectively): only in the late 1990s do we find the first attempt to clarify the two notions (Wang, 1998) and the publication of the first studies based on data collected from learners of Chinese in Japan and in the United States (Wen, 1997; Sung & Padilla, 1998).[6] The general Chinese fever which occurred after the 1990s stimulated investigation into motivation

to such an extent that Tan divides the work of Chinese scholars into three types of research targets and five fields. Regarding the latter, we have: i) classifications and reports on motivation types; ii) studies concerning the relationship between motivation and learning outcomes; iii) research into the relationship between motivation and other factors such as learning strategies; iv) works on the methods employed by language instructors to stimulate and maintain motivation; and v) the role played by motivation in the spread of Chinese as a global language. Interestingly, Tan's report provides a quantitative account of research regarding motivation in learning Chinese, and shows how works carried out by Chinese scholars, albeit begun later than studies carried out abroad, has rapidly increased and outstripped research undertaken outside China. Chinese studies have benefited from theoretical frameworks developed abroad, and have adopted a variety of methodological approaches, although these, according to Tan, are rarely based on large-scale samples.

Tan's data include research studies up to 2013. Various other studies, both from in and outside China, have been published since then. Among them, Sung (2013) investigates the motivation of 130 U.S. learners of Chinese from fourth to ninth grade, and links the motivational constructs to variables such as gender, grade level, and learner starting age. Sung's theoretical framework is based on the L2 Motivational Self System of Dörnyei, et al. (2006), comprising seven components: integrativeness, instrumentality, attitudes toward L2 speakers and their country, the learner's family's and friends' perception of the L2, self-confidence in L2 learning, appreciation of the L2 culture, and learner perception of the L2 community. The last three components do not emerge from Sung's data, which also do not explore any correlation between motivational constructs on the one hand, and variables such as gender, grade level, and learner starting age on the other hand. The differences found between young and old learners regards learners' perceptions of their parents' proficiency, which turns out to be higher and more positive for younger learners.

Gao bases his 2014 study on the taxonomy proposed by Noels et al. (2000) and acquires his data from a questionnaire administered to 149 school students to identify their motivations in learning Mandarin as well as their favorite learning activities. The motivation most frequently cited is the desire to understand people from different linguistic backgrounds, the advantages for traveling in China, curiosity about Chinese and China, the appeal of speaking a language that most of people do not understand, and the chance to speak with relatives in Chinese. According to Gao's data, both extrinsic and intrinsic motivations determines learners' choices. As for learning activities, participants express a preference for learning through play and by performing collaborative tasks.

THE PRESENT STUDY: RQS AND METHODOLOGY

The research questions that this study aims to answer are:

- What motivates Italian students to learn Chinese?
- Which activities do students consider most effective in learning Chinese?

Participants and Learning Times

Three schools in the Lazio region of central Italy were contacted by phone and email, and one gave its consent to participate in the study. The secondary school that accepted to take part is a public linguistic high school (liceo linguistico) and is one of the few which has added Chinese to its curriculum. The survey was conducted in April 2018 through a questionnaire administered in class by a teacher of Chinese. Forty-three school students participated. They had a mean age of 14.5 and belonged to two different classes: a first-year class of twenty-four students and a second-year class of nineteen students. The average time given over to Mandarin lessons each week was the same for both groups: three hours. As this is the time allotted for all curricular courses, the learning conditions of the group can be considered representative of high school learners of Chinese in Italy.

With regard to the time spent on learning Mandarin outside the classroom, we can see that the average is two hours (figure 5.1), and that this slightly increases according to the year in question (figure 5.2), but with no significant differences between the groups ($p > 0.5$). This result can be explained by the fact that learners are close in age and the participants' linguistic level is also not very dissimilar.

Instrument

A self-report questionnaire was used to collect data. This was written in Italian and administered in class by a Chinese instructor. When students needed any clarification about the questionnaire, the instructor explained the items verbally. The questionnaire is based on the one used by Gao (2014) and includes three sections: the first collects basic data about the participants' age, mother tongue, gender, and learning hours outside the class; the second includes a list of learning activities (seven items); the third consists of twelve items providing possible reasons for learning Chinese. For parts 2 and 3 of the questionnaire students were required to make selections on a six-point Likert Scale, with 0 representing "strongly disagree" and 5 representing "strongly agree."[7]

Chinese instructors were consulted in order to check whether the questionnaire was appropriate for the students' abilities and whether it reflected their learning conditions. The second section also regarded activities not usually included in language courses, but that learners could choose to do at home, such as singing or watching a movie; for this reason, I decided to keep these items. For sections 2 and 3 the final item was left blank to allow participants to add activities or reasons.

Analysis

The data were analyzed through SPSS software in order to obtain descriptive statistics and a factor analysis. The reliability of the two Likert scales (Cronbach's Alpha) was 0.53 and 0.55 respectively. The datum that these figures are not high can be explained by the fact that most learners are not used to taking part in this type of research, and so often left the items in the second section blank.

Results

Motivations for Learning Mandarin

The data obtained from descriptive statistics reported in table 5.1 were used to answer the first research question and these show that the top five motivations for students learning Chinese are: i) finding a job (item 12, mean = 4.76); ii) traveling or living in China (item 3, mean = 4.48); iii) speaking a language that most people do not understand (item 9, mean = 4.06); iv) understanding people with a different language and background better (item 1, mean = 3.88); v) speaking Chinese at restaurants/fondness for Chinese food (item 5, mean = 3.20). Interestingly enough, the top five motivations chosen by the two groups are exactly the same, a fact that can be explained by a number of factors. The first one is the participants' age, which is very similar for both groups. The second is represented by the learning environment, which is exactly the same for all participants. In addition to this all students, despite their young age, are aware of the importance of finding a job and link this point to the study of Chinese. It has to be noticed that the longitudinal and cross-sectional study conducted by Campbell and Storch (2011, quoted in Wen 2018), although focused on university students, also highlights how the choice to learn Chinese is linked to beliefs about China's promising future and potential job opportunities.

The third and fourth motivation can be explained by the personal challenge represented by learning a language and culture very distant from learners' original ones. Since their only occasion to come in contact with

native speakers is often represented by eating at a Chinese restaurant, both first- and second-year students include this motivation among the top five (see table 5.2). In addition to this, a factor analysis (principal component analysis with Varimax) was used in order to distinguish the main factors of the options given to participants. Table 5.3 shows that our data confirm Gao's (2014) results and also reveal the presence of five components. Factor 1 includes items 4 and 10 (parental choice and pleasing parents), which both relate to external motivations and account for 19.50 percent of total variance. Factor 2 consists of items 6 and 7 (liking martial arts and having Chinese friends), which are related to intrinsic motivations, that is, an interest in other cultures and peoples. This factor accounts for 14.23 percent of total variance. Factor 3 includes items 1 and 9 (a greater understanding of people of a very different culture, the pleasure in learning a language most people cannot speak), which again have to do with personal interest in language and culture. Factor 3 accounts for 12.87 percent of variance. Factor 4 includes items 2, 3, and 5, which cover instrumental motivations for learning (traveling or living in China, making Chinese friends, ordering food at restaurants). This factor accounts for 12.35 percent of variance. The fifth includes items 8, 11, and 12 (personal challenge, helping parents at work, employability), and regards external motivation. In this case, the variance explained corresponds to 10.13 percent.

The results show that, as in Gao (2014), students base their choices both on extrinsic and intrinsic motivations, but with a prevailing tendency toward extrinsic motivations. In this respect, it should be noted that employability, which is part of Noels et al.'s category of external motivation, turned out to be the prime motivation for learning Chinese. In other studies, quoted in Wen (2018), *instrumentality* turns out to be a significant factor in Chinese learning motivation, regardless of the students' origin. In our study, it appears that learners link the choice of this language to professional success despite still being very young and apparently far from the needs, and the opportunity, of applying their linguistic abilities to the professional field. In choosing this option they are probably influenced by their families and public opinion about the usefulness of learning Chinese, often hailed in the press as the "language of the future" and linked to the economic success mentioned in the first paragraph. Nevertheless, they do not reveal, or at least admit, any family pressure: interestingly enough, and again similar to Gao's data, motivation labeled as "parents' choice" received the lowest mean score, showing that learners consider learning Chinese a personal choice linked to the chance to live and travel in China (the second highest mean score after the "employability") and speak a language that most people do not know (the third highest mean score).

Favored Activities to Learn Mandarin

The second research question in the present study aimed at identifying the learning activities favored by students. The data shown in table 5.4 indicate that the favored activities are: i) writing characters (item 4, mean = 4.37); ii) talking with native speakers (item 7, mean = 3.82); iii) using the handbook (item 2, mean = 3.55); iv) listening to audio files (item 3, mean = 3.24); v) role play (item 6, mean = 2.40). As reported in table 5.5, the top five activities selected by the two groups are again almost the same, that is, items 4, 7, 2, and 3. Only for the fifth activity do first-year learners find it more effective to sing, whereas second-year participants prefer to take part in role-play activities. Factor analysis was also used in this case, and three components emerged (see table 5.6). The first component includes items 1 and 5 (watching videos and singing) and accounts for 26.08 percent of variance. The second one consists of items 3 and 4 (listening to audio files and writing characters) and comprises 21.67 percent of variance. The third one includes items 6 and 7 (role-plays and talking with native speakers) and accounts for 15.97 percent of variance. Item 2 was left out since the value is extremely low and it does not correlate with the other options.

Unlike the data discussed in the previous section, which partly confirm Gao (2014), our results show different tendencies and preferences. Our data suggest that students at this initial level consider writing characters as the most effective activity in learning Chinese. The focus on this aspect may be due to the specificity of the Chinese writing system, strikingly different from the alphabetic one, which is seen as an attractive challenge for learners. Another highly valued activity is using the handbook, which can be linked to the young age of learners who often rely heavily on written teaching materials.

Interestingly, learners also consider talking with native speakers very effective, even though they generally only have the chance to engage in this activity with language instructors in class. Again, it appears that the specificity and difference of Chinese stimulate their desire to approach this world by talking with Chinese people despite their own limited linguistic abilities. The preference expressed for role-play activities can be ascribed to the same desire to engage in communicative activities, whereas listening to audio files is deemed to be effective for improving listening skills and oral production in terms of correct pronunciation. It should be noted that didactic activities, especially in the first two years of learning, mostly focus on reading and writing, whereas learners' responses also show a desire to improve oral competence by giving greater prominence to speaking and listening. In expressing this desire, participants can take advantage of their scholastic background: as specified above, they attend the linguistic high school and Chinese is one of the three foreign languages they study: an integral part of their attitude and

awareness toward language learning is developed through learning, and in some cases, speaking, more than one foreign language.

PEDAGOGICAL IMPLICATIONS

Although much is still to be accomplished in this field, the findings obtained from this preliminary study can already be used to implement various changes in teaching Chinese in Italian high schools.

High school learners are rarely required to express their own expectations and reasons for studying a specific subject. This is probably due to the fact that all subjects are part of the high school curriculum and there is no option for adding or skipping any of them. Having said this, Chinese is usually only taught in one of the *sezioni*, or "sections," of the high school, usually a linguistic high school (while other sections might only offer European languages). In this case, a questionnaire aimed at exploring learners' motivations could be administered at the beginning of each school year in order for instructors to become more aware of students' expectations and attitudes.

As confirmed by the present study, it is common for students to have a variety of motives, both intrinsic and extrinsic: indeed, instructors could take learners' preferences into account and adjust their teaching methods accordingly. If students express a desire to use Chinese for work purposes, then basic vocabulary relating to this field could be introduced from the beginning in order to bring learning closer to students' real interests. If learners are motivated by a strong intrinsic interest in Chinese culture and society, instructors could use authentic material such as pictures and videos to show what living in a Chinese city or in a Chinese village looks like (and the extent of the differences between the two). Young people generally respond extremely well to visual stimuli: instructors could take advantage of this by encouraging them to collect their own material about China and then presenting their findings to their classmates either in their mother tongue or, for advanced-level students, in Chinese. These types of activities may eat into traditional language lesson time, but could positively affect learners' autonomy and their motivation for learning Chinese.

With regard to favorite learning activities, surprisingly enough, both first- and second-year students choose communicative tasks such as talking with native speakers and role-play. As our societies become increasingly plurilingual and multicultural, the number of Chinese visitors and residents in our towns and cities could be an opportunity for learners to become familiar with Chinese people before they have the chance to go to China. Communication with *huaqiao* is undoubtedly easier for advanced learners, but perhaps even

first-year students might be asked by the language instructors to buy, for example, stationery from the nearest Chinese shop and report back to class.

Based on our data, writing Chinese characters is a favorite activity in learning Chinese but, according to what instructors usually report, it is also one of the most challenging experiences for beginners. Compared to other educational contexts that are strongly influenced by the communicative approach to teaching foreign languages, Italian instructors are more conservative, and are convinced that they need to teach Chinese characters for students to attain literacy. This approach is partly influenced by the education that they themselves received in Chinese, which was largely based on the learning of written texts. Few take shortcuts or adopt avoidance approaches in teaching Chinese writing, and this is confirmed by the prominence generally given to this aspect of teaching Mandarin. Nevertheless, due to time limitations, the teaching of characters is usually restricted to identifying the radical and presenting the order of the strokes. Students are required to memorize characters at home in a rather repetitive fashion, that is, by writing them many times.[8] The methods usually used to evaluate mastery in writing include dictation, identification of the radical, and exercises in strokes order. Although students do not complain about this, the results obtained using these methods are often disappointing: after an initial enchantment with Chinese writing, students are often discouraged by the number of characters to be memorized. The modest results they obtain after making such tremendous efforts may also lead to a loss of interest.

In order to avoid this, teaching practices could take advantage of the variety of materials available for training writing using both traditional methods and digital resources. It is perhaps advisable to make learning characters more creative and more socially integrated, encouraging activities such as writing competitions or flashcards production as well as linking writing to vocabulary more realistically, that is, teaching characters in context, rather than in isolation. The literature on Chinese characters pedagogy abounds, and it has taken into account several aspects of this thorny issue.[9] While no quantitative data are available, some research on Italian learners, included in Brezzi and Lioi (2018), provide a few suggestions and reflections which also pertain to writing pedagogy. Among them, Lettere links the pedagogy of writing to the development of metalinguistic awareness and underlines how introducing a variety of techniques and methods for mastering characters might help learners to choose autonomously what they deem to be the most effective and most suited to their own personal preferences.[10]

As shown in the first paragraph, although Italy boasts a long tradition of sinology and the teaching of Chinese at university level, Chinese pedagogy at the high school level is a relatively new phenomenon. Further research is needed in this field, and this will undoubtedly be encouraged, in terms of ideas and data, by the successful introduction of Mandarin into high school curricula.

CONCLUSIONS

This preliminary study investigates the motivation of high school learners in learning Chinese and their favorite activities. Our data suggest that their reasons comprise both extrinsic and intrinsic motivations: on the one hand learners are driven by instrumental reasons such as finding a job and traveling or living in China; on the other hand, they are motivated by personal specific interests and want to understand this language and culture better.

As for activities, both traditional and communicative ones are valued: the former include repetitive activities such as writing characters, using the handbook, and listening to audio files, while the latter regard activities such as talking with native speakers and role-play. Given the fact that the participants in this study have never been to China and that their exposure to Chinese is rather limited, they show considerable awareness regarding the significance of their language choice (finding a job, speaking a language most people do not know) and in trying to engage in activities commensurate to learning a second language. Although the limited sample of this study does not allow us to make generalizations from the results obtained, I believe that instructors may benefit from the observations presented.

They can take advantage of the school students' eagerness in learning Chinese, and implement new methods and techniques in order to bring students closer to the language and the culture that they encounter in the classroom.

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NOTES

1. See Langé in Brezzi & Lioi (2018).
2. Data taken from a report published by Fondazione Intercultura Onlus.
3. Data regarding unemployment in Europe are provided by Eurostat, the statistis office of the European Union.
4. See Duff et al. 2013.
5. The acronym CAL stands for "Chinese as additional language."
6. All these works are quoted in Tan 2015.
7. The questionnaire is available at http://www.cflnetwork.org/.
8. This is confirmed by Di Muzio in Brezzi & Lioi (2018).
9. Among the scholars who focused on Chinese writing and vocabulary pedagogy, we should surely mention Helen H. Shen who devoted many works to this issue.
10. See Lettere in Brezzi & Lioi (2018).

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Chapter 6

Why Do Children Learn Chinese?

An Exploratory Study of Parental Beliefs, Classroom Motivational Strategies, and Young Learners' Motivated Behaviors

Xin Zhang

Successful second or foreign language (L2) learning and use are linked to several factors, one of which is motivation (for a review see Dörnyei, 2005). The notion of motivation is of great importance in foreign language (FL) education as it accounts for learners' primary impetus to initiate and, perhaps more significantly, their drive to sustain long-term L2 learning. Traditionally, the primary concern of motivation studies has been understanding what motivation is. In recent decades, motivation researchers broke new ground by beginning to apply the theoretical advances to inform pedagogical practices to motivate learners in the language classrooms (Alison & Halliwell, 2002; Dörnyei, 2001, 2006; Guilloteaux & Dörnyei, 2008; Huang, 2011). Along the same line, examining motivating factors that affect young L2 learners of Chinese, this chapter aims to assist scholars and teachers in understanding learners' parent-oriented motivations and classroom-motivated behaviors, and in developing motivational strategies in pre-K to elementary Chinese language classrooms.

The focus of this study on young Chinese learners is motivated by the substantial growth in enrollment in K–12 Chinese as a foreign language (CFL) programs in the United States in the past decade. This has vastly changed the landscape of CFL instructions in all education levels, especially the characteristics of incoming students who started learning Chinese at an increasingly young age. Yet, few, if any, empirical studies have been devoted to depicting the unique learning characteristics of this young learner population. The present exploratory study fills in the gap by examining why children at a private Chinese learning center in the Midwest begin to learn Chinese,

what role the parents play in making such a decision, and how their CFL motivations are sustained in the classroom.

MOTIVATION IN FOREIGN/SECOND LANGUAGE LEARNING

Two major theoretical orientations have long been widely investigated, emphasizing different aspects of L2 motivation as a complex construct (for an extended review see Dörnyei, 2009). First, adopting a social psychological approach, Gardner & Lambert (1972) propose that L2 motivations are initiated by *instrumental* and *integrative* orientations, which lead to a set of learning goals. This instrumental/integrative dichotomy distinguishes learners' practical reasons to learn a foreign or second language such as getting a job or an increased salary, and their motives to engage the target cultural community and speakers of the L2 such as a friend, a partner, or relatives.

Another line of work draws from the *self-determination theory* (SDT; Deci & Ryan, 1985), which makes a distinction between *intrinsic* and *extrinsic* motivations. To develop and sustain the intrinsic and self-determined extrinsic motivations, SDT posits that learners' sense of *autonomy, competence, and relatedness* must be supported in the learning and social contexts. Autonomy is defined as learners' feeling of control over language learning and uses without being pressured by external factors; competence is learners' capacities to perform; relatedness refers to learners' sense of connection with other agents in the learning and social context. Both L2 motivation frameworks, however, lack an emphasis on developmental age as a crucial factor in L2 motivation. Past studies have also focused primarily on adult and secondary school level learners.

MOTIVATING FACTORS FOR CHILD L2 LEARNING MOTIVATION

Adult and child L2 learners differ in the types of L2 motivation they have, which significantly affects the effectiveness of the pedagogical methods adopted in language classes. In pursuit of a more fitting L2 motivation framework for young L2 learners, some research has contributed to identifying the affective factors for young learners at different developmental stages.

Nikolov (1999) investigated the motivation of Hungarian children (ages six to fourteen) learning English as a foreign language (EFL) in a longitudinal study and found that children between six and fourteen are motivated primarily by 1) situational factors related to the classroom and teacher, as opposed

to integrative or instrumental reasons; and 2) intrinsically motivating pedagogical designs such as playful language activities and materials, as opposed to tests and rewards. The long-term investigation also showed that children's instrumental motives emerge at the age of eleven or twelve, but remain vague and general. In another study, Carreira (2006) reported that third graders (aged eight to nine) in Japanese elementary schools showed higher levels of both intrinsic and instrumental motives than sixth graders (ages eleven to twelve). Butler (2015) also reported that Chinese children in fourth grade (ages ten to eleven) can already clearly articulate the instrumental importance of English as an FL, and that parents are "the most influential source of 'imprinting' the utilitarian beliefs on children." While the diverse cultural and socio-educational contexts might have contributed to the age differences reported in these studies, the findings consistently suggest that 1) in early childhood L2 motivation is primarily triggered by intrinsically motivating factors, especially teacher- and classroom-related ones, and 2) instrumental motives emerge around the age of eight to eleven with strong parental influence.

A limitation of Nikolov's (1999) study is that it only drew from students' self-reported answers to an open-ended questionnaire (e.g., "Why do you study English?"). The responses thus didn't necessarily distinguish motivating factors accounting for their initiation of foreign language learning (e.g., my parents signed me up), and factors that later sustain a long-term L2 learning career (e.g., positive learning experience). To address this issue of ambiguity, the present study first investigated parents' motives and beliefs since their children (ages three to eight) started attending CFL classes around the age of two or three.

Parental Factors and Parent-Oriented Learning Motivation

Traditionally, parental factors in language learning motivation are conceptualized as external influences, which become weaker as learners grow older. In the early years of a child's development and schooling, however, parents' beliefs, attitudes, and involvement (e.g., language practice at home) play a crucial role in shaping young children's learning motivation and L2 achievement. Studies have identified parental/caregiver encouragement as a necessary factor for children's L2 motivation (Carreira, 2006; Masgoret, Bernaus, & Gardner, 2001). Sung and Padilla (1998) reported that parental encouragement and involvement in and padilla learning an L2 or heritage language are especially important at the elementary level, especially by heritage parents.

There has been a recent development in children's motivation research that focuses on children's *parent-oriented learning motivation* as "a mechanism through which parents' involvement facilitates children's achievement" (Cheung and Pomerantz, 2012, p. 820). Cheung and Pomerantz

(2012) found that children's parent-oriented motivation correlates with both extrinsic (controlled motivation) and intrinsic (autonomous motivation) forms of motivation. They proposed that parent-oriented motivation should be considered a unique type of motivation, distinct from the extrinsic-intrinsic dichotomy. Centering on parental factors in the development of motivation in young Chinese learners of English, Butler's (2015) study found that Chinese young learners show high levels of parent-oriented motivation, which as Butler speculates, at younger ages (third and fourth grade) contributed to students' high level of self-perceived competence (i.e., motivation). The present study is grounded in the perspective that parents' beliefs, attitudes, and involvement facilitate children's L2 achievement via their parent-oriented motivations.

Situational Factors and Motivational Strategies

Learning situations are crucial for young learners to sustain their interests in learning an L2, as it provides a context where potentially they can be motivated socially (for integrative reasons such as interacting with native speakers of L2), instrumentally (for pragmatic reasons such as getting a reward or good grades), and cognitively (by the challenges and joy of learning). Foregrounding the importance of learning environment in affecting the situated aspects of L2 learners' motivation, studies have been dedicated to conceptualizing the notion of *motivational strategies*[1] (Alison & Halliwell, 2002; Dörnyei, 2001, 2006; Williams & Burdern, 1997) and identifying motivational techniques adopted by language teachers to build a motivating classroom environment (Alison & Halliwell, 1993; Dörnyei, 1994, 2001; Oxford & Shearin, 1994; Williams & Burdern, 1997). Empirical studies also started to emerge that provide strong evidence that teacher's motivational strategies affect student motivation as manifested in motivated behaviors (Cheng and Dörnyei, 2007; Guilloteaux & Dörnyei, 2008).

The present study builds upon the model of motivational teaching practices proposed by Dörnyei (2001). Specifically, the second part of the present study adopted Guilloteaux & Dörnyei's (2008) the motivation orientation of language teaching (MOLT) as a classroom observation scheme to test which of the teacher practices derived from Dörnyei's (2001) framework are observable in the CFL classroom and how they affect young learners of CFL.

RESEARCH QUESTIONS

Grounded in the L2 motivation literature and findings described in the earlier section, this study explores the following questions:

1. What are the parental motives and beliefs that initiated and helped sustain their child's CFL learning at a young age at a private Chinese school?
2. What classroom-oriented factors affect the motivated behavior of young CFL learners at ages four to five and ages eight to nine? Specifically, which teacher's motivational strategies influence young CFL learners' levels of attention, participation, and volunteering?

METHODS

Two types of data are collected to investigate the two proposed research questions. The first is explored by analyzing surveys and interviews with parents who enrolled their child at a private Chinese learning center during the summer of 2018. To address the second question, classroom observations are analyzed to examine the situational (classroom-oriented) factors in children's CFL motivation.

Research Site

The present study was conducted in a for-profit Chinese language and culture learning center established in a state capital city in the Midwest. Founded in 2010, the center has since offered a task-based, immersion curriculum consisting of distance, individual, and classroom Mandarin instruction for young and adult learners, as well as business, educational, and cultural consulting services. Specifically, for young learners, the center offers pre-K (ages two to five), youth (ages six to thirteen), and young adult (ages fourteen to seventeen) classes, with beginning to advanced levels in each age group, and additionally private classes for students who can't fit into the regular class schedule. The discussion of learners at the research site in the present study will focus on the young learners only.

Three things differentiate the Chinese learning center from the traditional heritage Chinese schools and Chinese programs in school settings. *First*, the target student population at the center is children who have little or no knowledge in Chinese language and culture, whereas the heritage schools mainly target ethnically Chinese students with a Chinese-speaking environment at home. In the first six months of 2018, there were seventy-nine youth students (ages two to seventeen) who enrolled at the center,[2] of whom 50 percent are non-heritage, roughly 28 percent are adopted from China by an English-speaking family, and 22 percent are heritage Chinese. *Second,* the for-profit Chinese learning center isn't financially dependent on government funding. Student enrollment is thus critical in motivating the administrator and instructors to continuously offer a diverse curriculum and improve teaching practices to sustain students' motivation. *Third,* compared to a regular school

setting, the students (and their parents) at the center invest time and money in learning Chinese without getting school credit. The concurrence of these three factors creates a unique learning environment which essentially fosters children's CFL motivations, both parent-oriented and classroom-oriented ones. This makes the Chinese learning center a particularly suitable research site for the present study.

Participants

Fifteen parents of children who attend classes during the summer of 2018 at the Chinese learning center participated in the survey and interview, of whom five identified their families as 100 percent English-speaking homes with adopted children from China, seven identified their families as heritage Chinese (at least one parent is first- or second-generation Chinese American or Taiwanese American), and three identified as a non-heritage English-speaking family. All the heritage parents identified themselves as English dominant at home. The average age when their children started to learn Chinese is three.

Four teachers (two males and two females) at the center took part in the study. They represent a suitable diversity. Three are seasoned teachers (two Caucasians and one native Chinese) and one is a teaching assistant (heritage Chinese who speaks English as her first language). The two Caucasian instructors are the president and vice president of the center, who both have studied and worked extensively in China with a superior level of Chinese proficiency. All the three main instructors received graduate-level training in advanced Chinese language and culture, Chinese language pedagogy, or foreign/second language education.

Ten classes taught by the four teachers were observed during the summer term at the Chinese learning center, including both pre-K and youth classes led by the three main instructors. Among the ten classes, one pre-K class (ages four to five) and one youth class (ages eight to nine) were selected and analyzed in the present study.

Instruments and Procedures

Parental Survey and Interview

Parental motives and beliefs were collected employing a semi-structured one-on-one interview (roughly twenty-five minutes each), followed by a questionnaire. Parent-subjects were first asked to talk about their family background, beliefs, and attitudes that are relevant to why their child started learning Chinese, and if they wish to continue to learn Chinese in the future. Then they went through the questionnaire with the researcher and were asked to further elaborate on their choices to calibrate the research instrument and refine its measurement.

The questionnaire consists of three sections. Section I was composed of fifteen items concerning the reasons that their children started learning Chinese. These items also distinguish whether the motivations are parent initiated or child initiated. Section II consisted of ten items regarding parents' beliefs about why is learning Chinese important to their children, including (1) integrative factors that reflect one's orientation to communicate with and join the L2 speaker community; (2) egoistic factors that involves competence, knowledge, self-confidence, and respect from others; and (3) instrumental factors that relate to the utilitarian benefits of learning an L2. Responses on both sections of the questionnaire were recorded on a 5-point Likert-type scale ranging from "Strongly Disagree (1)" to "Strongly Agree (5)."

Analysis of Parental Survey and Interview

Data analysis follows the concurrent triangulation design in the mixed method approach (Tashakkori & Teddlie, 1998) by integrating both qualitative and quantitative analysis in response to the research questions. Data acquired from the parental survey are summarized using descriptive statistics. The central tendency of parents' opinions is measured by mean, and the variability is measured by standard deviation (i.e., to what extent do parent-subjects agree with each other on their responses to an item). Outliers were singled out and cross-examined with the interview data.

The commentaries collected during the interview with parent-subjects were analyzed adopting the grounded theory methodology (Glaser & Strauss, 1967). Interviews were transcribed, synthesized, compared across subjects to identify patterns, and finally compared with patterns revealed by the quantitative data to 1) validate the interpretation of the data through cross verification from different sources and 2) supplement the survey with parental motives and beliefs that the questionnaire didn't capture.

MOLT Classroom Observation Scheme

The MOLT (Motivation Orientation Language Teaching) classroom observation scheme (see appendix 6.1) used in the present study was adapted from Guilloteaux and Dörnyei's (2008) study to measure the quality of teachers' motivational practices and the degree of students' motivated behaviors in an L2 classroom. Teachers' motivational practices were grouped into (1) teacher discourse, (2) participation structure, (3) activity design, and (4) feedback. Students' classroom motivation was measured by (1) attention paid in class, (2) engagement in class activities, and (3) eager volunteering. Since the original MOLT scheme in Guilloteaux and Dörnyei's (2008) study was designed for English as a Second/Foreign Language classrooms with junior high school students (ages twelve to fifteen) in South Korea, adaptations

were made in the present study by updating and adding to the original MOLT categories to reflect teaching practices and student behaviors observed in the present research context.

Analysis of MOLT Classroom Observations

The adapted MOLT scheme was used to code the video recordings of the investigated classes in a minute-by-minute fashion. First, correlations between the teacher's motivational strategies and students' motivated behavior were examined. The teacher's motivational practices were measured by three composite motivational variables: (1) *teacher discourse*, (2) *activity design*, and (3) *feedback.* Each composite variable was formed by calculating the tallies under each category in every minute. The composite variable for *students' motivated behaviors* was formed using a two-level scale for students' minute-by-minute attention, engagement, and volunteering. Second, tallies indicating the number of minutes during which each teaching practice took place were calculated to illustrate the types and length of motivational strategies adopted in the two investigated classes, which affected young learners' classroom motivation.

RESULTS AND DISCUSSION

Parents′ Role

Survey and the interview data both suggest that parents are the primary impetus for young learners of Chinese who started leaning the L2 as early as ages two to three. In Part I of the parental survey dedicated to reasons their children first started studying Chinese, *parental encouragement* had the highest score and were most agreed upon among the parent-subjects indicated by the low standard deviation (see table 6.1). A comparison of responses to parent-initiated and child-initiated motivations, shown in figure 6.1, also revealed parents' dominant role in the initiation of young learners' CFL learning. Despite the linguistic and ethnic background of the family, parents reported during the interview sessions that parents were the ones who decided for the young learners to start learning Chinese in their early childhood because their children are not cognitively ready to make informed decisions for themselves.

While all parent-subjects identified that they "encouraged children to study the language," most parent-subjects (eleven out of fifteen) also agreed or strongly agreed that they "made their children study the language," suggesting that parents also play a crucial role in sustaining Chinese learning for children at pre-K to elementary stages. Parent-subject #12, a mother of two non-heritage learners (ages eight and nine), explained that by making her

sons study the language, she would explicitly communicate to the boys the benefit and made it clear that learning Chinese is not optional for them. Three parent-subjects opted for "neither agree nor disagree" while one responded that she didn't make their child study the language because she started speaking Chinese to her daughter from birth. This outlier parent-subject, born and raised in mainland China, was also the only parent-subject who speaks Chinese to her child at home, although most of the communication in the household is in English since her husband is not a Chinese speaker.

Heritage parents, especially native Chinese speakers, reported that they tried to teach or review learning content with their children at home with varying degrees of success. Non-heritage parents, although limited by their linguistic capacity, have made efforts to engage their children in a Chinese-speaking environment outside of the class. Some play Chinese cartoons at home while others routinely take their children to visit the biological family in China.

Initial Parental Motivations

Data collected from parental survey suggest that despite the family linguistic and heritage background of the parent-subjects, the initial motivations for enrolling their children in Chinese classes that received high scores include *future benefits* (mean=4.6, SD=1.056), *teacher and school reputation* (mean=4.4/4.27, SD=0.986/1.033), and *heritage* (mean=4.2, SD=1.265), in addition to *parental encouragement and reinforcement.* Based on this general frame, the following discussion on the initial parental motivations is also grounded in the family backgrounds and parent commentaries collected through the interviews. Specifically, patterns emerged from both quantitative and qualitative data indicate that heritage of the young learner and family linguistic/cultural background stand out as critical factors that distinguish the types and ranking of the parental motivations examined in the present study. Table 6.2 compares the top three initial parental motivations given by (1) heritage parents, (2) adoptive non-heritage parents, and (3) biological non-heritage parents, respectively.

Heritage-Oriented Motivations

Parent-subjects from heritage families picked *"it is their heritage language"* as the top reason for enrolling their children in Chinese classes, with ratings as high as *parental encouragement* (mean=4.85, SD=0.378). First-generation Chinese or Taiwanese American parents reported that a major motive for them is their children's communication with non-English speaking grandparents and relatives when they video chat or visit. At the same time, they

have different expectations for children's level of sophistication in Chinese language and culture understanding. Parent #9, born and raised in Sichuan, China, would go over Chinese homework and correct her daughter's tones and pronunciations at home. She expected her daughter to learn the standard Chinese pronunciation and speak Chinese in a way that "sounds like a native Chinese speaker without the foreignism many Americans have." Parent #15, growing up in a traditional Taiwanese family, wanted her son to learn to understand his heritage, but didn't expect him to adopt the same ideology as someone who grew up in Taiwan. Second-generation parents on the other hand often relate it to their own experience growing up in the United States. Parent #6, who grew up attending traditional heritage Chinese schools and majored in Chinese and East Asian Studies in college, commented that she wanted her child to learn Chinese as she did. Parent #4, a non-Chinese speaker who is married to a second-generation Taiwanese American, reported that her husband regretted growing up without learning Chinese and therefore they didn't want their children to miss the opportunity to learn the language at a young age.

Another group of parent-subjects that considered heritage as a crucial motivating factor are parents with no Chinese background but adopted their children from China. Survey data reveal that unlike heritage parents, adoptive non-heritage parents ranked *heritage* as the third most important reason (mean=4.6, SD=0.548), following *parental encouragement* (mean=4.8, SD=0.447) and *future benefits* (mean=4.8, SD=0.447). Interviews with adoptive parent-subjects revealed that they mostly enrolled their children at the Chinese learning center as soon as the adoption process was completed around the age of two to stay connected to the culture where they came from. They also reported that it made sense developmentally since their children were at a critical period to learn an L2 and they wanted to retain the exposure to a Chinese-speaking environment during earlier stages in their children's lives.

Future Benefits

Both biological and adoptive non-heritage parents' responses rated "it is important for their future" as the top parental motivation for their children's Chinese learning (mean=5/4.8, SD=0/0.447). While "*future benefits*" was ranked third by heritage parents, it had a lower rating (mean=4.29) and a high standard deviation value (SD=1.5) compared to *parent encouragement* and *heritage* (mean=4.85/4.85, SD=0.378/0.378), suggesting a low level of conformity among the heritage parent-subjects. The survey data suggested that non-heritage parents were motivated the most by the future benefits of learning Chinese for their children, while heritage parents are less motivated by the

future than sustaining their children's linguistic and cultural connections to their heritage. Parental beliefs regarding "why learning Chinese is important to my child" explored in the second part of the survey were analyzed and presented in a later section to illustrate further what types of future benefits the parent-subjects expect for their children.

Interviews with parent-subjects revealed that they have conceptualized how their children might benefit from Chinese learning at a more concrete level. Commentaries from parents showed strong parental beliefs in the cognitive advantages of learning an L2 at a young age, which many parent-subjects cited to justify their decision on the young starting age. Instrumental motivations were also frequently brought up by parents, especially in the context of increasing their children's future competitiveness at different stages. Parent #5, from an English-dominant heritage family, commented that being an English-Chinese bilingual speaker will be something that sets her daughter apart from other children at their elementary school. Parent #12, from a biological non-heritage family, believed that Chinese capacities would help her son down the road, especially "if he wants to go to schools like Harvard, it will make a major differentiation." Parent #9 envisioned that when her daughter goes to college, there will be lots of opportunities for her to study abroad in China for a year at joint institutions such as Duke Kunshan University and New York University Shanghai. Like parent #9, many parent-subjects stated that they want to lay the foundation so that in the future their children will have the option to take advantage of their Chinese skills if they want.

Teacher and School-Oriented Motivations

Teacher and school reputation were reported to be the top and third motivating factors for the biological non-heritage parents (mean=5/4.67, SD=0/0.578). Close analysis of the interview data showed that both heritage and non-heritage parent-subjects were attracted by the teacher and school-related factors. Both heritage and non-heritage parent-subjects valued the immersion learning environment, motivating tasks and activities, and the diverse class format and schedule offered by the Chinese learning center. Many parent-subjects compared the learning center with other local heritage Chinese schools, which target heritage children from Chinese-dominant families, and reported that the Chinese learning center met their needs and expectations pedagogically and schedule-wise.

Parent-subjects also considered the main instructors' engaging instructional style, personal charisma, and expertise in Chinese language and culture as crucial factors contributing to their decision to enroll their children at the Chinese learning center. Specifically, many subjects commented that they

consider the non-native Chinese speaking teachers with superior Chinese capacities as role models for their children to stay motivated and strive for the same level of sophistication as their teachers.

Community-Oriented Motivations

While community-oriented motivations were not explicitly investigated in the survey, interview data showed that parent-subjects, especially heritage and adoptive parents, expressed the need to connect to a community built around their children's Chinese learning. Some of the parent-subjects were already connected to each other before enrolling their children at the center, while others joined later and formed new relationships.

Since heritage parent-subjects all identified as English-dominant families, they reported that their children, compared to children from Chinese-dominant households, were not as accustomed to the classroom settings and levels of content in traditional heritage Chinese schools. Parent #14, for instance, wanted her son to learn with peers of similar linguistic background, so that "he won't feel frustrated and stressed out at a heritage school where his friends all speak fluent Chinese." Commentaries from adoptive parents showed that they also value the connections established with other adoptive families with adopted children of similar ages. They appreciate the fact that at the center their children can both learn about their heritage and establish a friendship with peers of similar life experience in Chinese class.

Parental Beliefs Regarding Future Benefits

Part two of the survey is examined to explore parental beliefs regarding is the benefit of learning Chinese the parent-subjects expect for their children, which will likely shape young learners' CFL motivation. Table 6.3 summarizes the descriptive statistics of parents' responses to "why I think learning Chinese is important to my child." The data indicated a general pattern that parent-subjects were more motivated by the prospect of their children gaining capacities interacting with Chinese speakers/community (i.e., integrative motivations) and competence-/knowledge-oriented egoistic development. Meanwhile, they were less driven by the potential career-related instrumental values and gains in self-confidence/respect from others.

Breaking the parent-subjects into 1) heritage parents, 2) adoptive non-heritage parents, and 3) biological non-heritage parents, table 6.4 presents a comparison of the top parental responses to "why I think learning Chinese is important to my child" given by the three subgroups. The top motivations reported by all three groups are 1) "It will enable them to be more open and understanding to different cultures and perspectives" and 2) "It will make

them a more knowledgeable person," both of which are egoistic needs related to the development of one's general competence and knowledge. In addition, heritage and adoptive parent-subjects believed that their children's capacity to communicate with native speakers of Chinese is a compelling rationale for sending their children to Chinese classes ("They will be able to meet and converse with native speakers of Chinese"), which conform with the heritage-oriented motivations previously discussed. On the other hand, in addition to prioritizing competence- and knowledge-oriented egoistic reason, biological non-heritage parents were the only subgroup that ranked "It will be helpful someday to get a job" as one of the top reasons they think learning Chinese is vital to their children.

Classroom Motivational Strategies on Student Motivation

Motivational Teaching Practices in Pre-K and Youth Classes

The second agenda of this study is to explore which motivational teaching strategies were adopted in the CFL classroom that effectively influence young learners at ages four to five and ages eight to nine. Table 6.5 presents examples of *teachers' motivational teaching practices* recorded in the adapted MOLT scheme based on the investigated class sessions. It also shows the proportion of each teaching practice that took place in a forty-five-minute class.

Given that the original MOLT classroom observational scheme was designed for older learner groups in a different learning setting, naturally some motivational practices were not observed and not presented in the adapted MOLT scheme. New items were added based on class observations and interviews with the instructors. The teacher's *gesture and enactment*, *facial expression*, and *intonation* were added as indicators of the instructor's level of passion and engagement during teaching, which, as the instructors reported, was "contagious" and crucial for young learners. *Game, tangible props, and movement* were also essential motivational elements observed in the classroom for young CFL learners. Games, frequently employed in the observed classes, provide a context that naturally elicits linguistic interaction in the target language in a fun and cognitively stimulating manner. Often involving tangible props, intellectual challenges, and physical movement, games are naturally engaging and promote learner autonomy when they have a sense of control over certain aspects of the "playing."

Correlations Between Teacher's Motivational Practices and Student's Motivated Behaviors

To explore the situational determinants of the young learners' motivated behaviors in Chinese classes, this study addresses three composite variables

that potentially affect students' classroom motivation: 1) teacher's discourse, both verbal and paralinguistic/extra-linguistic cues, 2) activity design, and 3) feedback. As table 6.6 shows, in the pre-K class (ages four to five) the teacher's discourse had a highly significant positive correlation with the students' motivated behavior ($r = 0.549$, $p < 0.001$). In the youth class (ages eight to nine), there is a lower, but still significant, positive relationship between the students' motivated classroom behavior and class activity design ($r = 0.408$, $p < 0.05$). The correlations confirm the theoretical prediction that the teacher's motivational strategies affect learners' classroom motivation (Cheng and Dörnyei, 2007; Guilloteaux & Dörnyei, 2008). Additionally, the pattern suggests that young CFL learners of different ages are likely to respond to different types of motivational teaching practices. In the pre-K class, younger CFL learners' motivated behaviors were strongly influenced by the teacher's verbal and nonverbal discourse, whereas in the youth class activity design had more influence on students' motivated classroom behavior.

CONCLUSIONS AND IMPLICATIONS

This chapter examined parental factors and classroom-oriented teaching strategies that affect the motivations of young CFL learners at pre-K and elementary school ages. A combination of survey, interview, and classroom observations was utilized for data collection. The findings suggest that parents and teachers play crucial roles in initiating, shaping, and sustaining young learners' CFL learning motivation.

Responding to the first research question, the heritage, linguistic, and cultural background of the parent-subjects have a substantial impact on parental motives and beliefs regarding their children's CFL learning. Heritage and adoptive parents are more motivated by keeping their children linguistically and culturally connected to their heritage, while non-heritage parents lean toward the potential future benefits, both developmentally and instrumentally. Regarding what parents expect their children to gain from learning Chinese, parent-subjects prioritize integrative capacities and competence/knowledge-oriented egoistic development over career-oriented instrumental gains. Meanwhile, the interview data reveal the parental belief, despite their family background, that learning Chinese at a young age can lead to increased competitiveness for their children.

To answer the second research question, the significant positive correlations found in the study shows that *teacher discourse* and *activity design* have a strong link to young CFL learners' classroom motivation. The classroom observation-based data reported contribute empirical evidence to validate the implementation of *motivational strategies* in CFL classroom settings with

young learners. The results also offer practical implications for CFL teachers by suggesting age-specific motivational strategies that were found effective in Chinese classrooms.

Due to its exploratory nature, the current study is limited by its small scope in terms of subject pool and the type of learning environment investigated. It proposes the following potential directions for future research. First, examination of the patterns found in the present study across CFL learning situation and student age. Second, inquiries about whether parental influences and classroom motivations transfer into long-term, self-determined L2 motivation, and if so what contributes to the process. Third, pedagogically oriented studies that focus on individual motivational strategies and how they can be adapted to a specific L2 learning environment, pedagogical approach, and learner group.

NOTES

1. Motivational strategies refer to (1) pedagogical interventions adopted by teachers to stimulate student motivation and (2) students' self-regulating strategies to manage their motivation (Guilloteaux & Dörnyei, 2008). The discussion of motivation strategies in this article applies to type (1).
2. This enrollment number doesn't include distance learning students.

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APPENDIX 6.1 ADAPTED MOLT CLASSROOM OBSERVATION SCHEME

Class:
Instructor:
Date recorded:

1. TEACHER'S MOTIVATIONAL PRACTICES/DISCOURSE											
Social chat											
Class routine											
Signposting											
Stating the communicative purpose or utility of the activity											
Establishing relevance											
Promoting integrative values											
Promoting instrumental values											
Arousing curiosity or attention											
Scaffolding											
Promoting cooperation											
Promoting autonomy											
Referential questions											
Gesture and enactment											
Facial expressions											
Intonation											
2. PARTICIPATION STRUCTURE											
Group											
Individual											
3. ACTIVITY DESIGN											
Tangible reward											
Personalization											
Element of interest, creativity, fantasy											
Intellectual challenge											
Tangible task product											
Tangible props											
Individual competition											
Team competition											
Game											
Movement											

4. FEEDBACK											
Neutral feedback											
Process feedback											
Elicitation of self or peer correction											
Effective praise											
Class applause											
Hint the answer											
STUDENTS' MOTIVATED BEHAVIORS											
Eager volunteering											
Engagement											
Attention											

Author Created.

Chapter 7

Integrating Content and Language Instruction in a Chinese Immersion Classroom

Wenying Zhou

Last decades have witnessed the boost of foreign language immersion programs in the United States. They are established to deliver the regular school curriculum through the target foreign language. This language and content integrated approach is called content-based instruction (CBI). According to Stoller (2008), CBI is "an umbrella term referring to instructional approaches that make a dual, though not necessarily equal, commitment to language and content-learning objectives" (p. 59). The "language" could be any L2, and the "content" refers to any subject areas taught in school, such as math, science, or any content that is cognitively engaging and demanding for students (Genesee, 1994). The following three main features make it a preferred choice (Genesee, 1994). First, the study of content creates an optimal immersion environment for students' language acquisition. Second, it offers authentic opportunities for them to negotiate meanings in different contexts. Third, it provides a relevant context for meaningful language communication and allows students to use the target language functionally.

Although CBI fits well within the framework of immersion programs where both content and language goals can be achieved simultaneously, there is an obvious lack of studies that provide immersion teachers with practical suggestions as to *how* CBI should be implemented, particularly in Chinese immersion programs. This deficiency often results in teachers' ignorance and unpreparedness for effective integration of language and content. It also prevents us from fully understanding the fundamental practices of Chinese immersion education.

To address the issue, this chapter will focus on introducing some practical CBI strategies to help Chinese immersion teachers develop the instructional knowledge and skills needed to assist students' development of conceptual

understanding in subject areas as well as acquisition of Chinese. It will start with a discussion on the role of CBI in immersion education. Following that is a description of how to implement it in Chinese immersion programs.

LITERATURE REVIEW

A review of the use of CBI in immersion education reveals that it results in significant gains in three main areas: academic achievement, linguistic performance in both L1 and L2, and motivation in learning (Tedick & Wesely, 2015). Specifically, immersion students who learn through CBI outperform their non-immersion peers on the measures of English language skills and subject areas. Additionally, their achievement gaps in these areas are smaller than those observed in non-immersion students. Furthermore, they develop higher-level L2 proficiency. Finally, CBI has a motivating effect on immersion students. Compared with their non-immersion peers, they have more positive attitudes toward study and other cultures.

Despite the above benefits, there are instructional challenges that lead to unsatisfactory student outcomes. For instance, teachers' use of functionally restricted language patterns to teach complex concepts and content limited the development of immersion students' productive language skills (Swain, 1988). There is also a lack of assessment tools, materials, and support for continuous immersion teaching (Zhou & Li, 2015).

On top of that, the fact that no guidelines exist regarding how CBI should be implemented has posed great complications (Cenoz, Genesee, & Gorter, 2014). Some programs carry out CBI by pairing up a content teacher and a language teacher to achieve the goal of teaching content and language simultaneously; however, it is difficult to assure the seamless cooperation between them, because they each have different teaching goals to achieve (Gilzow & Branaman, 2000). Moreover, it is hard to strike a balance between language and content instruction when they are delivered by two different teachers (Kong, 2014).

Other programs implement CBI by hiring one teacher to do both subject content delivery and foreign language teaching. However, they face the challenge of finding such teachers as are qualified in both language and content. The problem of finding qualified Chinese immersion teachers to employ CBI is especially pronounced, because they tend to major in foreign languages and lack a solid education in specific content areas (Zhou & Li, 2015).

In conclusion, despite the advantages of CBI, many factors affect its effectiveness: teachers' lack of pedagogical content knowledge, lack of appropriate instructional materials, unbalanced instruction of content and language, and insufficient attainment in developing students' immersion language

proficiency. It is evident that immersion teachers need specific guidelines and training in order for successful CBI to take place in an immersion program, particularly one such as Chinese immersion programs that rely primarily on less experienced teachers.

ADOPTING CBI IN CHINESE IMMERSION PROGRAMS

Met (1994) proposes that the successful implementation of CBI relies mainly on teachers' design of content and objectives, plan for students' language growth, creation of scaffolded instructional activities that make content comprehensible, and selection of appropriate teaching materials. All decisions are called for careful pre-teaching planning and during class instruction. To showcase how science is integrated with Chinese at a low-grade-level Chinese immersion classroom, the following four principles will be used as an umbrella:

1. Backward design: It is an effective way of providing guidance for course instruction and lesson design (Wiggins & McTighe, 2005), which involves three stages: first, teachers identify goals and desired learning outcomes; then they plan out formative assessments; and last they design instructional activities to achieve the well-planned learning objectives. This process is especially beneficial to immersion teachers because it encourages them to establish the purposes of instruction before implementing them into the curriculum.
2. Inquiry-based instruction: It is an effective way of engaging students to learn science, mainly because it presents the science knowledge in a meaningful way that helps students understand the processes of scientific inquiry. In addition, it provides an authentic and purposeful context that students need to develop the new language (Zweip & Straits, 2013). This approach starts with teacher-guided inquiry, then followed by students posing questions guided by the teacher, and last ends with student-driven inquiry led by a question.
3. Comprehensible input: Foreign language acquisition comes through understanding messages. In order for content-related language input to be comprehensible, it is necessary that teachers provide focused language input that is one level above students' current level or "i + 1" (Krashen, 1985).
4. Comprehensible output: To develop students' immersion language competence, it is important for teachers to create opportunities for them to use the target language functionally to discuss the content knowledge, which will contribute to their more in-depth understanding of both the language and content (Swain, 1993).

Pre-Teaching Planning

Swain (1996) suggests that it is necessary for immersion teachers to engage in fundamental planning about how to approach the integration of language and content in classroom teaching. Given that a truly CBI lesson has learning targets from both content and language areas, instruction and assessment in both areas, a careful pre-teaching planning is crucial, which includes knowing the curriculum, identifying content and possible challenges, setting goals and objectives, considering how to balance content and language, and finding materials. The decisions about all these can affect the long-term results of students' desired language development and academic outcomes.

Knowing the Standards

For K–12 Chinese immersion teachers in America, the content is often determined by school districts. To plan for content instruction, it is advised that they begin by familiarizing with local schools' curriculum. Given that the setting where CBI is practiced can be different, ranging from content-driven immersion programs to language-driven ones, it requires teachers to draw on a variety of resources, including curriculum standards in a specific content area, target language proficiency standards, students' previous performance assessments, and available course materials provided by schools. Knowing the content and language standards will allow teachers to understand local schools' emphases and expectations in specific curricular content, which will help them set reasonable instructional goals. Examining students' performance assessments will enable them to know students' current language proficiency level and mastery of old content knowledge. Accessing materials provided by schools allows them to prepare for clear content and language outcomes appropriate for students.

As Chinese immersion teachers are normally not experts in curricular content, translating English curricular standards into Chinese is the first step they should take. There are at least four key benefits. First, the process provides an opportunity to familiarize and understand the target concepts, knowledge, and skills required by the content curriculum. Second, the translation results present a list of language foci of the unit, which will help teachers identify what Chinese vocabulary items and language forms they need to teach explicitly or implicitly. Third, the process will make them aware of the separate content and language goals and clarify their separate foci, which can improve their delivery and balance of the instruction. Fourth, the information about the unit will help them make decisions concerning time allocation on each topic. Below lists the translation of a kindergarten science unit into Chinese, including some key concepts and topics that Chinese immersion teachers might consider in lesson planning.

English Standards	*Chinese Translation*
• Describe living things.	什么是生物？ 生物有哪些（人、动物、植物） 生物的特点（生长、活动、繁殖等）
• Describe life cycles of living things.	生物是怎么生长、有后代的？ 动物：从小蝌蚪变成青蛙 植物：从种子发芽长成豆芽

Identifying Content

After becoming familiar with the target content curriculum, it is time to determine the content to deliver. While doing so, it is important that teachers ask the following questions: 1) "Will my students be interested in it?" Considering student interests and needs will not only enable teachers to find the "appropriate" content to teach, but also identify possible specific problems that they may have with the content in advance. 2) "Will students be able to use the content and language functionally after they learn them?" Considering possible outcomes will help teachers determine the content and language skills that students are expected to develop for language practice and content exploration. 3) "How many units will be taught during the semester and how many classes need to be devoted to each unit?" The decision making is highly variable depending on different schools, individual teachers, and students' performance. In the above case of "living things," the concepts of "living things" and "non-living things" may take less than one week; however, the topics of their characteristics, relationships, and life cycles may take intensively four to five weeks. While designing the time duration for each unit, it is advisable that the teacher know students' prior content knowledge and Chinese language proficiency levels.

Identifying Materials

While identifying the target content, teachers also need to know resource possibilities, including available resources in English and/or Chinese. Assigned textbooks will be provided by the school, which can be used as the main teaching resource. Given that textbooks only address the curricular content, in order to help students develop and practice the Chinese language skills needed to understand and discuss the target content, teachers can also find useful materials on the internet, where numerous websites provide a variety of auditory, visual, and video materials in Chinese. Using these materials requires teachers to select carefully by considering the appropriateness in terms of students' language proficiency level and achieving content and language teaching objectives.

When selecting appropriate materials, teachers can use the following as criteria: (1) the materials should be relevant to the curricular content, address

students' interests, and help teachers achieve the planned instructional objectives. (2) They should be age appropriate and have the potential to further students' cognitive development. (3) They need to be Chinese language appropriate, which will ensure students' motivation and engagement in learning the content through CBI. It is advised that the difficulty level of the chosen materials is a little higher than students' current Chinese proficiency level, and the language is form focused and predictable to students. It would be particularly helpful if teachers evaluate the difficulty level of vocabulary and grammar as well as the familiarity level of the content before using them. (4) It is also important that teachers find a variety of materials. Different materials serve different teaching purposes. Some may be used to teach main concepts or practice certain Chinese language forms, while others may be used to discuss content topics. The variation will allow teachers to design taxonomies of activities to engage students in active and deep learning.

However, for Chinese immersion teachers, the availability of appropriate teaching materials may be scarce. There are several approaches to overcome this barrier. One approach is modification. Some Chinese materials found may be relevant to the content, but the language is too hard. In such cases, teachers can modify and make them suit students' language proficiency levels. Another approach involves the modification of other teachers' materials or student work and/or collaboration among them. For instance, those who teach low grade levels can ask those who teach one grade level higher for available materials or student work (e.g., written) and then modify them for classroom use. The last approach is that teachers create such materials as dialogs, texts, stories, songs, and nursery rhymes that are both relevant to the target content and at students' Chinese language proficiency level. Although it may require considerable time, personal confidence, and competence, it is worth trying because teachers are the ones who know what students need in terms of content learning and Chinese language development.

Setting Goals and Objectives

To ensure effective content-based instruction, teachers should be clear about their goals as well as specific content and language objectives that define the learning outcomes that students are expected to achieve. A teacher's decisions about their relationships will determine the language skills students develop, the content will be taught, and the degree to which the two are balanced.

In most 50/50 Chinese immersion programs, Chinese serves as the medium to teach the content. Therefore, it is reasonable to start with setting content goals and then learning objectives, using backward design. For instance, to teach the topic of "living things," the teacher can start with two content goals such as "living things have life cycles" and "plants' life cycles are different

from animals'." They present the essential content knowledge that teachers expect students to master by the end of the unit.

Then the teacher can set several objectives that define where students will be in relation to these goals. For example, to achieve the first goal, the teacher needs to ensure that "students will be able to identify or name different living things" and "tell their main features." To achieve the second goal, "students will be able to compare and contrast the different life cycles of plants and animals" and "describe their different life cycles with prompt, literacy and other formative assessments." Setting such goals and objectives first will enable teachers to focus more on global understandings of the curriculum rather than on daily activities, with a clear vision of the overall learning outcomes.

After that, it is necessary to write language targets. Cummins (1984) proposed two categories of language objectives, for example, Basic Interpersonal Communicative Skills (BICS) and Cognitive/Academic Language Proficiency (CALP). BICS refers to social language that is, used in highly contextualized daily conversations, while CALP is the language most commonly used in much more decontextualized classroom settings for academic purposes. The latter requires deeper understanding of the language, and it is much more cognitively demanding than the former. It is necessary that Chinese immersion teachers be aware of the differences and provide scaffolded support in the instruction as well as opportunities for the development of CALP. Below list some BICS and CALP language objective examples when teaching the topic of "living things."

Key CALP Vocabulary	*Key BICS Vocabulary and Structures*
• Living things 生物	…是… (a.是什么？ b.是A还是B？)
• Animals 动物	…有… (a.有什么/几个？ b.有什么不同/相同？)
• Non-living things 非生物	…和…（不）一样
• Sunlight 阳光	…在…; 在哪里（a. …生长在…； b. …在…verb）

In addition, teachers need to understand that students' being able to use the BICS language to communicate in everyday social settings does not necessarily mean that they will be able to function successfully using CALP language. To develop CALP needed for success in content area subjects, students need many more practices beyond BICS language learning under teachers' guidance. Setting different objectives for the two layers of language skills enables teachers to scaffold their language instruction and design activities that promote their development of both language skills gradually.

Designing Backward Further

After setting goals and objectives for both content and language, it is necessary that teachers think backward further about how many and what tasks

students will need to accomplish in order to achieve each content and language objective. Take the topic of "living things" as an example. To ensure that students will be able to identify and name some important living things, teachers might need to design two to three simple activities; however, to make them describe the life cycles of living things, teachers may need to come up with at least ten activities to first scaffold students' understanding of the language and content, then gradually move to teacher-guided production, and last, ideally, student production with prompts.

While designing such activities, teachers need to make sure that: (1) it oftentimes takes more than one activity to attain a simple learning objective; (2) some activities need to be more cognitively demanding (e.g., those are designed to discuss the topic with learned language) than others (e.g., those used to present basic content information); (3) abstract terminologies need to be made concrete for students, and hands-on experiences need to be provided to assist students' science exploration; (4) linguistic support is provided to make the content delivery comprehensible; (5) taxonomies of activities should be designed to achieve planned objectives and engage students in active learning of both language and content; and (6) all activities should be context embedded. Besides linguistic support, a lot of external supports such as pictures, realia, manipulatives, and meaningful context need to be provided for students to comprehend the message.

While planning the above activities, it is essential that teachers always design formative assessments to evaluate students' performance after each activity. This will guarantee the quality of their instruction and students' mastery of both language and content. Assessments should be performance-based, ongoing, and content and language integrated.

Last, it is necessary that teachers look over the activities outlined and consider what other teaching activities they might need to fill in to facilitate students' learning of content and language.

Balancing Content and Language

How should content and language be balanced? It may be helpful for teachers to look at content through the lens of language development. To do that, they can examine the content-obligatory objectives (linguistic features to help students effectively approach the content) and content-compatible objectives (linguistic features supported by the content) set for the CBI instruction (Snow, Met, & Genesee, 1989). Make sure that both are focused within one unit, but not necessarily treated equally all the time. The reason is simple: sometimes teachers need to focus more on language instruction because students need to acquire the language to study the content, while at other times, they may focus more on the subject content after students have acquired the needed language.

Another way to judge whether the right language/content balance has been attained is to ensure that students can receive meaningful interaction with cognitively demanding content, as well as explicit attention to the development of linguistic skills. To do that, teachers should design scaffolded instruction that not only teach concepts and facts related to subject matter learning, but also provide sufficient comprehensible input for language acquisition to take place. For example, they would repeatedly use the core language forms related to the subject matter area in various meaningful contexts so that students can understand the information as well as the language structures. Over-emphasizing one at the expense of the other will prevent students from experiencing such content-language-integrated learning and cognitive development. As long as teachers design structured activities with specific content and language objectives in mind, they will be able to reach the right balance of content and language instruction.

During Class Instruction

Learning a foreign language is a complex meaning-making process that involves different modes of communication. As such, it is best to employ a whole language approach when teaching content, using holistic strategies that integrate the four language skills and naturally connect them with content. To do that, Chinese immersion teachers need to break down daily lessons into workable components to provide necessary scaffolding: first introduce concepts, then reinforce the information through developing Chinese language proficiency, next integrate Chinese literacy, and last create opportunities for interactions and production.

Introducing Key Concepts

Many teachers tend to introduce key vocabulary (concepts) through learning each individual word, which is not only boring but also not meaningful. Introducing key concepts through story-telling is a more effective way because it exposes the content information to students in meaningful contexts and helps them focus on meaning making (Zhou & Li, 2017).

Before telling stories, teachers need to ensure that (1) the story book they choose contains Chinese texts with captivating illustrations that support the texts and aid comprehension; (2) the book is about the content that will be covered and includes the target key concepts; (3) the language of the story is the repeated use of relevant linguistic forms; (4) it is built on students' known language structures and prior content knowledge; and (5) the content is delivered in just the right quantity and at a language proficiency level a little bit above students' current one.

Chinese immersion teaching requires teachers to constantly model the use of CALP language that is necessary for the acquisition of academic knowledge and skills, along with the BICS language necessary for everyday communication. As young learners enjoy listening to stories again and again, it is imperative that teachers read the story aloud to students on a daily basis, which will not only help promote the development of their correct pronunciation and intonation, but also expand their receptive vocabulary and sentence structures. After repeating the story several times, students will have a better understanding of the story as well as the meaning of the target concepts. This repetition allows key concepts and other language items to be acquired naturally and reinforced with ease, as they develop their receptive language skills.

To expose students to key concepts only once or in one format is far from enough. Students need to hear the Chinese language spoken by different people in various contexts. Therefore, it is necessary that teachers present the information in varied ways. Besides story-telling, they can use media to reinforce the main concepts. For example, they can find Chinese videos that talk about "living things" and show them to the class. If they cannot locate an appropriate one, they can show one or two English videos to the class, with the main purpose of further clarifying the key concepts in students' first language. The second time teachers show the video, they can voice over it, using the Chinese vocabulary and structures that students have just been exposed to, focusing on reinforcement.

Assessing student learning after introducing new concepts enables teachers to know how well students have learned. The results provide them with valuable information regarding whether they need to re-teach certain concepts or further provide linguistic support. There are many ways to evaluate students' performance. For example, to learn whether they have comprehended the story, teachers can design simple questions to seek students' simple linguistic feedback with "yes" or "no" or responses to alternative questions. If teachers feel that students have reached a higher level of Chinese proficiency that enables them to use more complex language to address cognitively demanding content, they can ask more difficult questions using "how," "why," "what," etc. Such assessments will challenge students to think critically and address their multiple ways of learning. For assessments to be effective, teachers need to ensure that they are always closely linked to the target curriculum expectations of the lessons of study.

After students have mastered key concepts, teachers can use the strategy of "compare and contrast" to further clarify some similar concepts. For instance, "animals" and "plants" are both categorized under "living things," but they are different in many aspects. Teachers could bring in pictures of animals and plants, and have students tell their differences and similarities, using learned Chinese, and then classify them accordingly, using a Venn diagram.

Reinforcing Concepts through Developing Chinese Proficiency

The introduction of key concepts in Chinese should be gradual in nature; otherwise, inadequate grasp can lead to serious retardation in the future learning of subject matter. Therefore, it is necessary to reinforce the learned key concepts through developing students' Chinese language proficiency. Take the unit of "living things" as an example. To develop their listening skills in the content area, teachers can tell a form-focused story that goes with the content like this:

这是小狗, 小狗是生物, 小狗会跑, 小狗在地上跑。
这是小草, 小草是生物, 小草会长大, 小草在地上生长。
这是我, 我也是生物, 我会跑, 会长大, 我在学校学习。

While telling young learners such form-focused stories, it is essential that teachers create gestures or movements to go with the story. There are several benefits: (1) the use of gestures/movements is more like a game, and it helps to keep students busy, motivated, and engaged; (2) the use of gestures in sync with language helps make the story more comprehensible to students; (3) the mixed use of verbal and nonverbal representations works on students' different senses at the same time; and (4) when learning new concepts in math and science, students usually display their mastery of the knowledge through the use of gestures before they develop the correct discourse skills (Roth, 2001).

After demonstrating gestures while telling the story several times, teachers may release the responsibility gradually to students. First, they can tell the story again without gestures but have students do the movements that go with each sentence. This also serves as an assessment of students' receptive skills. Later, to develop their speaking skills, teachers can guide students from doing the gestures to producing the language. They can start with saying the first one or two words of a sentence and encouraging the class to finish it by saying the rest. Then they can gradually have students produce more Chinese until they can say all full sentences. The scaffolded instruction and teacher-guided practice help develop students' receptive skills before they proceed to productive expressions.

Integrating Chinese Literacy

Teaching content through Chinese is not only about comprehending the content information and talking about the topic at the factual level, but also requires the development of literacy skills that are necessary for accurate, complex, and sociolinguistically appropriate language application and deep learning of the content. To do that, teachers should encourage students to

"engage with language" so that "language permeates instructional activities across the curriculum" (Lyster, 2007, p. 133).

There are many ways to achieve the target. For low-grade-level Chinese immersion students, teachers can employ the strategy of "shared reading." When doing it, they can use the same story book that they choose to do reading aloud or select other theme-related stories. Using the same story book doesn't mean repeating the same instructional activities as in the reading aloud task; rather, it requires teachers to use it to develop students' higher-level literacy skills.

Shared reading involves the teacher and students reading from a "big book" that all students can see so that they may follow the text. Given that Chinese is not a sound-out language, it is necessary that the teacher models tracking each of the words during the process, because it will help students make the associations of Chinese sounds and scripts. Shared reading sessions will take place over several days and include some of the following steps:

Pre-reading: When doing pre-reading, teachers introduce the title, author, and illustrator of the story book as well as show the cover. They then take a picture walk by talking briefly about what the characters in the book are doing. Sometimes, if possible, they stop at certain pages and invite students to predict what they think will happen next.

During reading: There is no uniform way as to what and how during reading instruction should be conducted. Teachers can do many things during this stage with the main purpose of achieving planned literacy purposes. It is advised that instruction should integrate both experiential and analytic language activities. For example, they can invite students to join in after reading several times. They can have the class do choral reading while tracking the words. They can draw students' attention to some specific linguistic features and then create an oral or written cloze activity for students to complete. They can clarify the meaning of certain expressions and then create opportunities to use them appropriately. They can also teach characteristics of one or two Chinese punctuations. They can even teach writing and reading strategies and have students apply them in other situations.

Post-reading: During this period, teachers can wrap up the reading by having students sequence the story they have read. They can provide some repetitive linguistic forms and have students create their own story writing. They can also engage students in the discussion of one or two content-related topics, using learned language. The production should focus on linguistic practice, content understanding, and application.

The above teacher-facilitated activities help students scaffold their Chinese literacy development. It is important that teachers make sure that students are progressively challenged cognitively, but provided with contextual and linguistic support.

Providing Opportunities for Interaction and Production

Content-based tasks that involve students in noticing, retrieving, and generating language are effective in facilitating L2 acquisition (Swain, 1993). In planning quality instruction, teachers need to ensure that students are not only exposed to input to develop language and content skills, but also are engaged in output that requires both language and content skills. Therefore, it is necessary to provide students with ample opportunities for teacher-student, student-student, whole group, and small group interactions in the classroom.

There are many ways to do that. Some of them have been described in the sections above. For instance, when assessing student learning of content knowledge, teachers can encourage students to respond to teacher prompts and questions in simple Chinese, then a single word answer to an alternative question, and finally simple phrase answer to a special question (how, who, what, etc.). As students learn more, teachers can have them provide full sentence answers to open-ended questions.

In addition, after reading form-focused stories, teachers can invite students to join in, and then gradually fade out. When doing shared reading, they can create literacy activities to consistently push students to use new words and expressions, more complex language structures, and more culturally appropriate language in their interactions and responses.

Partner work and group work can also be used to increase students' language output. For example, information gap tasks that involve two students in asking and answering questions about missing information of a Chinese text about "living things" can engage them in understanding the meaning of content area messages as well as seeking answers to come up with a complete picture of the text.

While creating opportunities for students to produce Chinese language output, it is important that teachers increasingly push students to provide longer and more varied responses as they progress toward higher levels of Chinese language proficiency. For instance, teachers can ask students to give full-sentence replies, encourage them to expand upon short answers with more new words, or support their answers with one example or more evidence. Doing this will facilitate students' practice of a wide range of learned concepts and Chinese expressions, make the internalization process natural and gradual, and help expand their Chinese productive repertoire.

CONCLUSION

CBI enables immersion students to be exposed to a considerable amount of target language while exploring interesting curricular content. It allows them

to be engaged in meaningful and functional language activities when exposed to contextual content information. Therefore, it is effective in developing their communicative competency in the target language and enhancing their development of content-related academic skills.

However, there are many instructional concerns arising out of the implementation of CBI in immersion programs, and they are even more acute in the case of teaching science: (1) students' inability to use the target language as an effective tool to acquire science knowledge, which has led to their linguistic incapability to engage in deep learning and high-level cognitive development; (2) there is a lack of effective way to assess their balanced development of both content and language; (3) the lack of level-appropriate teaching materials impacts the quality of CBI instruction; and (4) teachers' lack of required pedagogical content knowledge to teach the content hampers them in implementing CBI.

The findings appeal for the need to provide practical suggestions to immersion teachers. This chapter has highlighted some pedagogical and practical knowledge regarding the implementation of CBI in Chinese immersion programs, focusing on the pre-teaching planning and during class instruction phases. By showcasing how to set language and content goals and objectives, teach content, develop language skills, balance content and language, and provide students with comprehensible input and opportunities for output, the chapter provides guidelines and suggestions to Chinese immersion teachers so that they will have a large methodological repertoire to meet students' needs.

Although this chapter is about Chinese immersion education, it can be implied beyond that. The practical suggestions could be useful for teachers of other foreign language immersion programs and have a great potential to affect their classroom instruction. They would also benefit teacher preparation programs at American universities when they provide courses or training to foreign language immersion teachers.

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Chapter 8

Using the Chunking Method in Teaching Chinese Characters in a Sixth-Grade Chinese Dual Language Immersion Classroom

Ko-Yin Sung, Hsiao-Mei Tsai, and I-Chiao Hung

THE CHUNKING CONCEPT

Chunking is an information-processing mechanism that assists people's memory by breaking information into smaller pieces. According to Miller (1956), human beings have limited memory capacity; hence, smaller instead of bigger chunks of information are easier to process and remember. In the education field, the concept of chunking has been identified as an important key mechanism of effective learning (Gobet et al., 2001). In applying the chunking concept in Chinese character acquisition, decomposing a Chinese character into chunks to reduce the complexity of character forms and present smaller units for encoding is often called the chunking method or visual chunking (Sung & Tsai, 2019). A chunk in a character often is as small as a radical, which is a unit within a character that carries semantic or phonetic information of the character, or as big as the whole character. However, sometimes a radical can be further decomposed into smaller chunks. Sung and Tsai gave the example of the character 筷 (chopsticks), which consists of 快 as the phonetic radical, which can be decomposed into two smaller chunks, 忄 and 夬. In sum, approximately 560 chunks are identified in Chinese and 118 of them are found in 80 percent of characters (Cao et al., 2013). Cao et al. stressed that, while on average a character has 10.15 strokes, almost all characters (98 percent) can be decomposed into five or fewer chunks. Hence, if visual chunking is used to learn characters, learners' visual memory load can be greatly reduced and, as a result, characters can be easier to recall. Although studies (Anderson et al., 2013; Chua, 1999; Wu et al., 1999) have found that

Chinese native children as young as first grade had the basic knowledge of the chunking concept such as the internal structure of characters and used it to help encode characters, there is a lack of studies on whether the chunking method can be equally effective on young learners in the Chinese dual language learning context. Therefore, this chapter replicates the research method adopted from Sung and Tsai in which the chunking method was explicitly taught to a group of one-way Chinese dual language learners for a semester, after which its affect was tested.

CHINESE CHARACTER ACQUISITION

The current literature has identified certain practices and knowledge that could facilitate character acquisition. Practicing handwriting characters is one of them. For example, Cao et al.'s (2013) study found that college Chinese as a second language (CSL) participants who practiced writing prior to a recognition exercise performed better and produced greater brain activation than the ones who only practiced the pinyin phonetic system. Cao et al. explained that the writing effect on character recognition could be due to the fact that handwriting practice helped learners decompose the structures of characters, directing learners' attention to form. Similar to Cao et al.'s finding, Guan et al. (2011) claimed that handwriting characters assisted in character recognition and helped make a stronger connection between meaning, form, and pronunciation. More importantly, in another study, Yeung et al. (2013) found that handwriting fluency is a predictor of Chinese composition skills.

Even though some studies have stressed the effectiveness of handwriting on character learning, in their experimental study, Wang and McBride (2015) reported that Chinese children who practiced handwriting by merely copying characters did not perform as well on the word-level writing task as the children who not only practiced handwriting, but were also taught morphological awareness, which refers to radical knowledge including meaning and position in a character. In a similar study, Wu et al. (2009) also confirmed that morphological awareness instruction improved second-grade Chinese children's reading and writing. The positive effect of radical knowledge is also identified in CSL studies. For example, the U.S. college learners in Shen's (2000) study who acquired good radical knowledge had better character recognition skills. Furthermore, a different study (Shen & Ke, 2007) found that radical knowledge not only facilitated character recognition but also positively correlated with word reading ability.

In addition to handwriting and morphological awareness, chunking has gained attention in character learning in recent years. The explicit teaching of chunking often extends the knowledge of morphological awareness to

also include the teaching of the structural configurations of characters and the decomposition of characters into chunks. Chunks in characters are constrained to particular locations in certain structural configurations; randomly placed chunks make nonexistent characters (Chang et al., 2014). Hence, it is important to learn the eleven configurations found in approximately 6,000 commonly used characters and study the placement of different chunks in the configurations (Chen et al., 2011). Studies on the effect of the chunking method in different CSL contexts are recent. For example, Xu and Padilla (2013) studied the effect of the chunking method to high school learners of various learning backgrounds. The particular chunking instruction trained the learners how to use chunking as a strategy to read and write characters and taught the learners radical knowledge. On the other hand, the control group was taught only the stroke sequences of characters. The study results showed that the chunking group scored significantly higher on the character tests; however, the retention of the characters was short, as the chunking group did not score higher than the control group on the delayed test administered two months later. In a different study, Chang et al. (2014) also compared the chunking method with other types of instruction (e.g., passive reading and stroke reporting) in a beginning Chinese class at the college level and the positive effect of the chunking method on character writing was again reported.

In Chen et al.'s (2013) study, the researchers tested the character teaching method with the chunking concept that included the introduction of structural relations, along with radical knowledge such as radical definitions and functions, meaning description, and stroke practice. After three weeks of such instruction to more than 100 Chinese heritage language learners of various levels, the researchers concluded that the chunking instruction was much more effective than the traditional method, which included repeated phrase practice, making sentences, and reading texts. The study results illustrated that the group that received the chunking method outperformed the control group on orthography knowledge and the phonetic and semantic radical awareness tests.

Lastly, Sung and Tsai (2019) investigated the effect of chunking in a first-grade one-way dual immersion program in the United States. The researchers reported positive effects of the chunking method on the chunking group's performances on radical meaning, stroke sequence knowledge, structural knowledge, and stroke and chunk knowledge, all of which are important skills that predict young learners' future Chinese literacy fluency. Moreover, the chunking group retained most of the knowledge after a month, indicating a positive long-term effect of the chunking method. On the other hand, the study reported that the chunking group performed similarly to the control group on recognizing the correct two-character words that link to certain pictures presented on the tests. The researchers explained that certain Chinese characters

carrying abstract meanings are difficult for young learners to recall even if the learners understand the meanings of the radicals. The high level of abstraction of some of the characters on the tests could be the reason the chunking method could not exert its full effect on the chunking group's performance.

The results from the few aforementioned empirical studies aforementioned have reported mostly the positive effect of the chunking method; however, these studies are limited in the following ways. First, all except Sung and Tsai's (2019) study had a focus on older learners. For instance, Xu and Padilla's study (2013) involved high school learners and the other studies (Chang et al., 2014; Chen et al., 2013) only included adult learners. There is a lack of chunking studies on young CSL learners, whose cognitive development is at a different stage compared to adult learners. Second, all except Sung and Tsai's study were conducted in a Chinese as a foreign language context where Chinese was taught as a subject. Studies like Sung and Tsai's in which the Chinese language was both the target language and the language of instructional medium are few. Considering the limited scope in the current literature, this study intended to lessen the current research gap by involving young CSL learners in the dual language setting for the length of a semester. To be specific, this chapter adopted the study design from Sung and Tsai's study, in which chunking instruction was used in a quasi-experimental setting, and lesson tests and a delayed comprehensive test were used to detect the effectiveness of the instruction. A major difference between this and Sung and Tsai's studies is that they involved true beginners who just entered the Chinese dual language immersion program as first graders, whereas in this study, more experienced sixth-grade learners were included. The purpose of involving higher-grade learners was due to Sung and Tsai's statement in their study limitation that the numbers of strokes and chunks of the characters learned in first grade were much fewer than the numbers in commonly used characters, and it was unknown whether the chunking instruction exerted its full effect.

RESEARCH QUESTIONS

This chapter aimed to study whether the chunking method facilitated sixth-grade Chinese dual language students' character learning. More specifically, this study asks the following questions:

1. Does chunking instruction have an immediate effect on the sixth graders' learning of Chinese characters in a one-way Chinese-English dual language immersion classroom setting?
2. How well does chunking instruction help retain the sixth graders' character knowledge?

3. Does chunking instruction have an interactive effect with the length of time in which chunking is introduced to the sixth graders?

THE STUDY CONTEXT

This study involved two classes of sixth graders enrolled in a one-way Chinese dual language immersion program in Utah. The program served "a student population comprised of a predominant majority of native English language speakers with limited to no proficiency in the L2" (Utah Dual Language Immersion, 2017). The two sixth-grade classes were taught by the same two teachers, one of who offered 50 percent of daily instruction in English to each class and the other taught in Chinese 50 percent of time. In sixth grade, the students were taught the subjects of Chinese, science, and social studies through the Chinese instructional medium. The one-way dual language immersion model in Utah (called the Utah model) strictly enforces the language separation policy, which is that absolutely no languages other than Chinese can be used in the classrooms where Chinese teachers teach; hence, the Chinese teacher in this study used lots of gestures, pictures, and modeling to help students understand the contents of the subjects.

The Chinese textbook required for the sixth-grade dual language learners was *Primary Three Chinese* (3B), published by a Singaporean publisher originally designed for third-grade students learning Chinese as a second language in Singapore. The current study was conducted in the daily Chinese Language Literacy class in the fall semester. The instructor spent thirty minutes daily on the learning of characters. During the semester, the teacher taught five lessons in which the participants learned a total of 141 target characters (equal to 91 target vocabulary words). The 141 target characters have an average 8.4 strokes and 2.2 chunks, which are close to the average strokes and chunks of commonly used characters. This study examined the effect of the chunking method on character learning during the daily thirty-minute character instruction time for a semester.

PARTICIPANTS

There were forty-six sixth graders in the program where the study was conducted. All forty-six students agreed to participate in this study. The current study has a quasi-experimental design, which assigns one class as the experimental group (hereafter referred as the chunking group) and the other as the control group. The chunking group consisted of thirteen males and twelve females, and the control group consisted of ten males and eleven

females. All students in the two classes came from English native speaking households. However, one parent in each class knew some Chinese and spoke it at intermediate level. In terms of the students' socioeconomic levels, both classes were in the middle or upper-middle classes, with none of them receiving free lunch at school. With respect to the sixth-grade Chinese teacher's background, she was a Chinese native speaker, who held a master's degree in second language teaching and had one year of Chinese dual language teaching experience.

PROCEDURE

Before the study began, a pre-test on Chinese character recognition was given to the participants. The test contained all 141 target characters that would be introduced to the participants in the semester. The pre-test results showed that the scores of two participants in the chunking group were well above the standard deviation from the mean; hence, the two participants were excluded in the current study. In sum, a total of twenty-three participants were in the chunking group, while twenty-one participants were in the control group. During character learning time, the chunking group was taught the following for each lesson:

(1) Character Knowledge: The chunking group was taught radical knowledge (both semantic and phonetic radicals), phonetic knowledge (using pinyin), how to decompose the characters into chunks, each character's configuration, and the stroke sequence of each character.
(2) Writing Practice: In order to check their understanding of the target characters, the chunking group was asked to write a full sentence for each target character after they learned the characters. For example, if the lesson taught twenty characters, the students wrote twenty sentences.
(3) Reading Practice: Students were asked to read the lesson text in pairs. When one was reading, the other needed to listen carefully for any mispronunciations, circle them, and record the number of characters they read correctly.
(4) Chunking Activity: In small groups of three or four, the students were asked to put the correct chunks together to make characters. The characters were the target characters taught in the lessons.
(5) Reviewing the Chunking Concept: As their weekly homework, the students were given a worksheet in which they were asked the configuration of each target character and were asked to connect chunks that could be combined to create a character.

On the other hand, the control group was taught the following:

(1) Character Knowledge: The control group was only taught the stroke sequences and the phonetic knowledge of the target characters but they were not taught radical or chunking knowledge (e.g., radical, meaning, character configuration, or decomposition of characters).
(2) Writing Practice: The control group was asked to write a full sentence for each target character like the chunking group did. However, since the control group was not taught the radical and chunking knowledge and had extra instructional time left, the control group was encouraged to write a second sentence for each target character and draw a picture that represents the character.
(3) Reading Practice: The reading practice the control group did was identical to the chunking group's.
(4) Vocabulary Guessing Game: The teacher asked two students to come up to the front of the class each time to act out a target vocabulary word, and the rest of the class needed to guess and call out the vocabulary word.
(5) Vocabulary Writing Practice: The teacher showed the target vocabulary list on the white board and asked the students to write a full sentence with a minimum of seven characters for each vocabulary word.
(6) Reviewing the Target Characters: The control group's weekly homework included writing the target characters, their pinyin, their stroke sequences, and their meanings in English.

A character lesson test was administered when the classes finished learning a lesson. Each test contained ten questions in each of seven sections, and each question was worth one point:

Section 1 (Character Writing): The students were shown ten pictures on PowerPoint slides that represented the meanings of ten two-character lesson vocabulary words and were asked to write down the ten words on the test.
Section 2 (Pinyin): The students were shown ten pictures on PowerPoint slides that represented the meanings of ten two-character lesson vocabulary words and were asked to write down the pinyin for the ten words on the test.
Section 3 (Stroke and Chunk Knowledge): The students were presented ten characters with missing parts and were asked to complete the missing parts by writing the complete characters in empty boxes below the characters with missing parts. The missing parts might be a few strokes or a chunk.
Section 4 (Structural Knowledge): The students were shown ten sentences related to the lesson text, each with one erroneous character. Compared to the accurate character, the erroneous character might be pronounced the same or similarly, or have a similar but different structure. The students

were told to circle the erroneous characters and write the correct characters in empty boxes next to the sentences.

Section 5 (Character Configuration): The students were shown eleven character configurations, each with a number assigned to them. The students were also shown ten target characters. They were to identify the correct configuration of each character by writing the assigned configuration number next to each character.

Section 6 (Radical Knowledge): The students were shown ten characters and were asked to write their semantic radicals next to the characters.

Section 7 (Radical Meaning): The students were shown ten characters and were asked to write the meaning of each character's semantic radical in English next to the characters.

A delayed comprehensive test (Test 6) was administered two weeks after the students finished learning the fifth lesson to check the level of character knowledge retention. The same test format was used in the delayed test (seven sections with ten questions in each section). The scores of the character tests were used to detect the effectiveness of the chunking method. Mixed Repeated Measures ANOVA tests were run to investigate whether any significant simple main effects of the method used in learning characters and the time spent using the method were found. In addition, the tests also tried to detect any interaction between time and method.

Results

Section 1 Character Writing

The simple main effect of time was significant in the character writing section, $F(5, 215) = 44.968$, $p = 0.000$. In other words, performances were significantly different at different times. The post-hoc tests illustrated that both groups scored very low on test 1 and very high on tests 2 and 4 (see table 8.1). Several reasons might have contributed to these results. First, the characters tested in test 1 carry many abstract concepts. The meanings of the test 1 vocabulary words such as "commemorate" (纪念), "encourage" (鼓励), and "capable" (能干) are difficult to convey through pictures. For example, for the vocabulary "commemorate," the teacher showed a picture of soldiers' graves and American flags, which hinted some of the students to write "brave" instead as the answer. Second, the characters in tests 2 and 4 are less abstract, including action words and more commonly used daily words such as "television" (电视), "music" (音乐), "fly" (飞), and "run" (跑). These words can be easily conveyed through pictures without misinterpretation. In this section of character writing using pictures as hints, no significant

difference was found between groups, and there was no interactive effect between method and time.

Section 2 Pinyin

The simple main effect of time was significant in the pinyin section, $F(5, 215) = 34.767$, $p = 0.000$. The post-hoc tests revealed that both groups scored significantly low on tests 1 and 3 (see table 8.2). This result could be explained by the tones carried by the characters in the tests. In tests 1 and 3, more characters carry second or third tones, while the other tests contained fewer characters with second or third tones. In Mandarin Chinese, the second tone is the high rising tone, and the third tone is the falling-rising tone. Current literature has documented that due to the acoustic similarity and complex phonological rules (e.g., in certain situations the third tone is changed to the second tone), mastering the two tones is difficult for not only CSL learners (Hao, 2012), but could sometimes be confusing to native Chinese listeners as well (Yang et al., 2015). In the pinyin section, no significant difference was found between methods, and there was no interactive effect between time and method.

Section 3 Stroke and Chunk Knowledge

A significant simple main effect of time was found in the stroke and chunk knowledge section, $F(5, 215) = 18.147$, $p = 0.000$. The post-hoc tests illustrated that both groups scored low on tests 1, 3, 5, and 6, but scored much higher on tests 2 and 4 (see table 8.3). This result could be attributed to the different levels of stroke and chunk complexity in the tests. In tests 1, 3, and 5 and the delayed test in which the groups did not preform well, the average stroke numbers per character are higher than the other tests. For example, the lowest test, test 5, has an average of 9.7 strokes per character, while test 4 has only an average of seven strokes per character. As the characters become more complex, it is harder to accurately recall the missing parts in the characters. In addition, no significance was found between methods, and there was no significant interactive effect between method and time.

Section 4 Structural Knowledge

The main effect of time was significant in the structural knowledge section, $F(5, 215) = 13.165$, $p = 0.000$. The post-hoc tests reveal that both groups scored high on tests 2 and 4, but low on other tests (see table 8.4). This result is very similar to the one in the previous section (Section 3 Stroke and Chunk Knowledge). Due to the characters in tests 2 and 4 being less complex, it was easier for the students to identify erroneous parts and write down the correct form of the characters. On the other hand, no significant effect of method

was found, and no significant interactive effect between method and time was found.

Section 5 Character Configuration

A significant effect of time was detected in the character configuration section, $F(5, 215) = 7.807$, $p = 0.000$. The post-hoc tests showed that the significant difference occurred within the control group, which scored lower on tests 3 and 5, and performed better on the delayed test (see table 8.5). A close look at the content of the tests revealed that the configurations of the characters in tests 3 and 5 were less commonly seen than some of the characters included in the delayed test. For example, the character 事 (thing), in test 3, has a single configuration, which only accounted for 1.2 percent of the 6,000 commonly used characters (Chen et al., 2011). In contrast, the characters included in the delayed test contained a few more characters that have the vertical or horizontal configurations, which represent approximately 70 percent of the 6,000 commonly used characters. However, the different configurations of the characters in the tests did not affect the performance of the chunking group. In fact, a significant main effect of method was found, $F(5, 43) = 41.873$, $p = 0.000$, indicating that the chunking group performed significantly better than the control group in identifying character configurations. In addition, there was an interactive effect between method and time, $F(5, 215) = 4.975$, $p = 0.000$. The scores of the chunking group showed that the highest score the group made was the last lesson in test 5. In addition, the chunking group retained their knowledge and did equally well in the delayed test.

Section 6 Radical Knowledge

The main effect of time was significant in the radical knowledge section, $F(5, 215) = 9.743$, $p = 0.000$. The post-hoc tests illustrated that the control group scored significantly low on test 5 and bounced back up on the delayed test (see table 8.6). The test scores revealed that the majority of the control group did not try to answer the section on test 5. The teacher explained that the control group seemed unsteady due to the upcoming holiday season and decided not to try the section that was not explicitly taught to them. However, the scores bounced back up in the delayed test after the teacher encouraged them to try their best to answer all sections. Moreover, this section found that the main effect of method was significant, $F(5, 43) = 108.503$, $p = 0.000$. The chunking group performed much better than the control group. In addition, there was an interactive effect between method and time $F(5, 215) = 3.232$, $p = 0.008$. The scores of the chunking group showed that they retained radical knowledge well and scored the highest on the delayed test.

Section 7 Radical Meaning

A significant simple main effect of method was found in the radical meaning section, $F(5, 215) = 50.245$, $p = 0.000$. The chunking group did significantly better than the control group consistently (see table 8.7). In addition, they retained radical meaning knowledge well and performed well on the delayed test. On the other hand, there was no significant effect of time or interactive effect between time and method.

DISCUSSION

This chapter attempted to evaluate the use of the chunking method in character learning of sixth-grade Chinese dual language learners. Mixed repeated-measure ANOVAs were run to detect if the chunking method, the duration of the method used, and the interaction of method and time had effects on the students' character learning. The results of the ANOVA tests showed that the chunking group was more capable in identifying the semantic radicals in the target characters (section 6 in the tests) than the control group. This finding was not aligned with Sung and Tsai's (2019) study with first graders. The contradictory findings between this and the other study could be attributed to the different levels of complexity of the target characters introduced between first and sixth grades. As mentioned by Sung and Tsai, when the average numbers of strokes and chunks of the target characters are much lower than the average of the commonly used characters, the chunking instruction did not exert its full effect, and the results were not significant. In contrast, in the current study where the average strokes and chunks of the target characters were more complex (similar to the ones of the commonly used characters), the use of the chunking method was significantly better than the other method to recall the semantic radicals of the characters. The statistical results also revealed that the students who received chunking instruction in this study had superior knowledge of character configurations and radical meanings (sections 5 and 7 in the tests). Ho et al. (2003) have stressed that character configuration and radical knowledge are two of the important attributes predicting one's reading, writing, and sentence comprehension. Numerous studies investigating both Chinese native children and CSL learners have reported significant findings of these skills correlating with Chinese literacy skills. For example, Leong et al. (2011) identified orthographic skills at the radical level to be a significant predictor of Chinese reading comprehension among third-grade Chinese-speaking children; Yeung et al. (2013) reported that semantic radical knowledge could account for first- to fourth-grade Chinese children's written composition—and Shen (2000) found that young adult learners of

Chinese who obtained superior radical knowledge scored much better on reading tests than those with less radical knowledge.

On the other hand, this chapter did not find any significance of the chunking method on the learning of character writing, pinyin, stroke and chunk knowledge, or the internal structures of characters (Sections 1, 2, 3, and 4 in the tests). It appears that the control group, which focused more on handwriting meaningful sentences using the target vocabulary, was equally effective compared to the chunking method. A couple reasons could possibly explain the results. First, sophisticated chunking skills take time to build. In the case of Chinese native speaking children, Pak et al. (2005) reported that for some children, advanced chunking skills did not develop until they reached fourth grade. Considering that Chinese native children were more experienced with characters and possibly received both explicit and implicit instruction of chunking more frequently (e.g., it is common to see Chinese mothers point out identical chunks in different characters to their children) (McBride & Wang, 2015), it can be assumed that a semester of chunking instruction for the sixth graders in this study, who were learning only third-grade-level Chinese (referring to their textbook level), did not have sufficient time to develop advanced chunking skills; hence, the effect of chunking was minimal and only showed in the radical and configuration sections of the tests. Second, meaningful handwriting could be an effective method for character learning. Based on Cao et al.'s (2013) study, the participants' handwriting practice led to greater visual attention to the details of the character (e.g., strokes and chunks); thus the learners were more sensitive to them when trying to recognize characters. Neuroimaging studies (James & Gauthier, 2006; Longcamp et al., 2003) have illustrated that there was an interaction between perception and action; therefore, motor memories from handwriting could strengthen character recognition. However, Cao et al. (2013) also found that the effect of handwriting could be only temporary. In their study, a delayed test after three months revealed that the chunking method better retained the character and its connection to pronunciation and meaning.

In sum, this chapter found that chunking instruction significantly increased the learners' radical and character configuration knowledge, and that the learners retained the knowledge well in the delayed test two weeks after the last lesson (lesson 5) was taught. However, possibly due to the temporary positive effect of handwriting in the control group and the chunking group's chunking skills not yet developing into the advanced level, both groups performed similarly in the other sections of the tests. When both groups scored similarly, one factor that could significantly affect both groups' performances was the levels of difficulty of the character features. For example, when more characters carry more difficult tones (second and third tones), or when more characters had more complex strokes, chunks, or structures in a test, the

learners scored low. This again illustrates the possibility that the chunking group's underdeveloped chunking skills were not sufficient to encode difficult characters. This result also implies that it might be beneficial for teachers to start cultivating the chunking concept as early as possible to allow learners sufficient time to develop the skills when they start as true beginners.

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Chapter 9

Instructional Interventions and Character Learning Strategies

A Study on Orthographic Study Assignments

Yan Xie

BACKGROUND

American students agree that the major challenge in learning Mandarin Chinese was to learn the characters (Everson, 2011; Ke, Wen, & Kotenbeutel, 2001). Chinese is a language of logographic writing, which means the written symbols correspond to morphemes instead of to individual sounds. Numerous studies have investigated how learners who are speakers of an alphabetical language process characters (e.g., Lee-Thompson, 2008; Perfetti & Tan, 1999; Perfetti & Liu, 2005; Zhou & Marslen-Wilson, 1999), and what strategies they adopted (e.g., Jackson, Everson, & Ke, 2003; Shen, 2005). Some studies (e.g., Xu & Padilla, 2013) suggested that instructional interventions were able to develop radical awareness and promote the use of radical knowledge-based strategies (e.g., Shen & Ke, 2007; Shu & Anderson, 1997; Williams & Bever, 2010). However, it is still unclear in what specific ways orthographic study assignments, if used as instructional interventions, can influence strategy use.

CHARACTER LEARNING STRATEGIES

Chinese language is classified as logographic writing because the language lacks sound-script correspondence. When alphabetic language speakers learn Chinese, they need to develop a new cognitive process that involves the processing of three levels: sound, shape, and meaning. Primarily due to

this feature, Chinese was labeled by the U.S. government as one of the most difficult languages (Category IV). To help students master Chinese, character learning strategies have become a significant research agenda. Jiang and Zhao (2001) found six types of cognitive strategies used by Chinese L2 learners from different language backgrounds, including analyzing radical components and practicing learned characters by writing. Shen (2005) and Sung and Wu (2011) confirmed that analyzing radical components was an important strategy used by English-speaking learners. Shen (2005) identified fifty-nine items of strategies used by different levels from beginners to advanced, and thirty of them were commonly used, including using orthographic knowledge to help memorize characters, relying on sounds as cues to connect meaning and shape, and trying to understand the syntactic functions of newly learned characters. The role of orthographic knowledge in learning characters or words has been recognized in earlier studies, such as the studies by Taft and Chung (1999) and by Shen (2000), which reported that radical knowledge helped beginner learners to memorize characters. Jackson, Everson, and Ke (2003) found that non-native adult learners were able to use orthographic knowledge-based strategies to study characters at the end of the first year of learning. Shen and Ke (2007) proposed that there were two factors relating to the evidence of non-native adult learners' radical awareness: adults' cognitive maturity in perceptional organization, and instructors' brief demonstrations about the construction of compound characters. Since adult learners are cognitively ready to understand the graphic structures of characters, scholars have provided suggestions on how to use instructional interventions to promote character learning. The next part will introduce the studies by some of them.

INSTRUCTIONAL INTERVENTIONS

Shen (2013) suggested that when practicing instructional interventions, instructors should consider increasing both phonological and orthographic awareness. In the retention of meaning and pronunciation, the mode of providing visual and audio pronunciation as well as an English definition was found to be better than only using the visual mode (Chung, 2008). For students having a good command of pinyin, pinyin provision was very helpful for learning words, but it was less effective for lower-level students who did not have strong pinyin knowledge (Lee & Kalyuga, 2011). Lee and Kalyuga also demonstrated that placing pinyin right under the corresponding characters (horizontally) made better use of working memory and thus was more effective than placing pinyin beside the characters (vertically). Xu and Padilla (2013) suggested that teachers should introduce the concept of chunking

(bùjiàn) and interpret character type and origination because this method could enhance memory. Instead of all instructions coming from teachers, they recommended using teacher-cued instruction that would allow learners to explore the chunking of characters. Shen and Xu (2015) suggested that instructors could group words together based on semantic relationship, logical relationship, and linguistic feature, and allow students to practice them in the form of teamwork and problem solving. Some studies documented the advantages of using technology-based activities. Wong, Boticki, Sun, and Looi (2011) reported a successful application of the Chinese PP app into character-forming activities on mobile phones, in which learners used the radicals provided to form characters and to share them in groups. Xu and Padilla (2013) disclosed that stroke-sequence-animation presentation plus writing produced better results in form recognition, but animation by itself had a better effect in recalling meaning.

PURPOSE OF THE PRESENT STUDY

The existing studies have displayed various character learning strategies used by non-native adult learners who are speakers of alphabetical languages, and concluded that radical awareness is a cognitive ability that beginner learners could achieve if they were given instructions about character graphic structures, and as a result, they would be able to apply radical knowledge-based strategies to learning characters or words. Due to the positive effects of radical awareness on character learning, pedagogical interventions are necessary for students to enhance their ability to decompose characters and to increase the use of radical knowledge-related strategies. However, while many studies demonstrated that adult learners were able to use radical knowledge-based learning strategies (Jackson, Everson & Ke, 2003; Taft & Chung, 1999; Shen, 2000; Shen & Ke, 2007), or suggested that instructors should use instructional interventions focusing on developing radical awareness (Shen, 2013; Shen & Xu, 2015; Wong et al., 2011), few studies have investigated how orthographic study assignments as instructional interventions can influence character learning strategies and how the learning strategies will change if the assignments are changed. Seeking answers to this question will help instructors to incorporate pedagogical interventions into character teaching and learning in an improved manner. Therefore, this study will address three research questions.

1. Did the students change their character learning strategies from the time of having no orthographic study assignments to the time of having such assignments? If so, what are the changes?

2. Did the students change their character learning strategies from the time of having orthographic study assignments to the time of having no such assignments? If so, what are the changes?
3. From most to least, what was the order in which each of the groups used the five categories of strategies investigated in the Strategy Inventory (Shen, 2005)?

METHODOLOGY

Participants

The students taking Mandarin Chinese Level One (2017 spring/fall), Level Two (2017 spring/fall and 2018 spring), and Level Three (2017 fall and 2018 spring) at a private university in an Eastern U.S. state were invited to complete the surveys. One hundred and fifty-five students completed the surveys. To assure the data reliability, native speakers of character-related languages, for example Korean, Japanese, etc., were excluded, so the answers of 118 participants were usable, including 44 at Level One, 58 at Level Two, and 30 at Level Three. However, 14 at Level One did not continue to Level Two, and 10 at Level Two did not take Level Three; these students' data could not be used. Finally, the completed surveys of 108 participants were used, including 30 Level One (9 male and 21 female), 48 Level Two (18 male and 30 female), and 30 Level Three (12 male and 18 female). The participants (average age = 20.7) majored in a variety of academic areas at the time of the study, such as business, TESOL, government, global studies, accounting, computer science, engineering, education, history, music, fashion design, etc. All are non-heritage learners, and had little or no Chinese language knowledge when they enrolled in the Level One course.

Setting

A professor holding a doctoral degree in language education taught the three courses. Each class met for three hours a week and offered three credits. In the initial three weeks of the first semester (Level One), the students learned the tones and pronunciation skills, and were familiarized with the major categories of characters and with forty commonly used radicals (Liu et al., 2003, 2017). They were aware of the fact that the characters of the phono-semantic category constitute the largest number of Chinese characters, and they understood that orthographic knowledge-based strategies are effective in learning characters and vocabulary. In the fourth week, they started to learn vocabulary and sentence structure. While the surveys were being conducted, each

class was studying *Integrated Chinese Level 1* (third or fourth ed.) authored by Liu et al. (2003, 2017).

The instructor used the target language (Chinese) to teach. At the beginning of each semester, the students signed a language pledge to use only Chinese in class. To make students benefit from the immersive teaching method as much as possible, the instructor required them to preview vocabulary before class and to complete a vocabulary quiz at the beginning of each new material lesson. The students always follow the instructor to read the vocabulary aloud a couple of times before they started to engage in independent preview out of class.

Writing each character ten times counted toward the quiz score. The students wrote down the characters in their Character Workbook before class. The workbook provided the stroke order, pinyin, and English definition of one character at a time with thirty blocks in which to write. By filling in ten blocks, the students wrote ten times. At the beginning of the class, the instructor collected the character writing homework, and distributed the vocabulary quiz to the students. In each quiz, characters of vocabulary were mixed and randomly numbered. The students wrote pinyin with a tone mark over each character. Then they located and copied down the numbers of characters to match the English definition. For example, 老师 (lǎo shī: teacher) and 学生 (xué sheng: student) were numbered as "1. . . 2 老 3. . . 4师 5. . . 6学 7. . . 8 生"; the students were supposed to copy down 2/4 next to "teacher" and 6/8 next to "student" to get points. In addition to this task, the students at Level Two and Level Three had to reproduce certain characters and write down pinyin with tone marks. Prior to the quizzes, the instructor had announced which characters the students would need to write from memory.

The students at Level One did not have orthographic study assignments until they moved up to Level Two. After they began Level Three, they no longer had such assignments. The orthographic study was an open-book assignment with one to two pages to be completed before class. The assignments provided the information on character formulation and supplied the English definition and/or sound of the radicals/units. To complete the assignments, the students, with the aid of the information, identified appropriate radicals/units in the characters and copied them down to fill in the blanks above lines (see figure 9.1).

Instrument

The study used three instruments. Firstly, the researcher adopted the "Strategy Inventory for Character Learning"[1] (Shen, 2005) to collect quantitative data to investigate the strategies. The inventory consists of fifty-nine multiple-choice items under five strategy categories: the strategies used when a character is

first introduced, the strategies used after a character is introduced, the strategies used to memorize, the strategies used to preview and review, and the strategies used to practice. Secondly, the researcher conducted a semi-structured face-to-face interview with sixteen randomly selected students from the class at Level One (2017 spring) and Level Two (2017 spring) (see appendix 9.1). As it was not possible to access the Level Three class, the researcher did not interview the students at this level. In the interviews, the participants answered questions about their methods of studying characters and vocabulary, and how orthographic knowledge affected their study. Follow-up questions were asked whenever necessary. Thirdly, the researcher gave the students at Level Two (2017 fall and 2018 spring) and Level Three (2017 fall and 2018 spring) an open-ended written survey in which they elaborated the strategy changes they had made since the previous semester and explained the reasons (see appendix 9.2). The Level Two students who had orthographic study assignments explained the changes by comparing this time to the time when they took Level One and did not have such assignments. Level Three students who used to have but no longer had such assignments explained the changes by comparing this time to the time of Level Two when they had the assignments.

Procedure

The researcher obtained permission to conduct surveys and interviews with the students at the aforementioned university. The survey lasted three semesters. Near the end of the spring semester of 2017, the students at Level One and Level Two were invited to complete the Strategy Inventory for Character Learning. One week later, as previously mentioned, the researcher interviewed sixteen students randomly selected from the two levels. In the middle of the fall semester of 2017, the researcher invited the students at Level One, Level Two, and Level Three to complete the inventory. One week later, she distributed the open-ended survey to these classes. In the middle of the spring semester of 2018, the students at Level Two and Level Three completed the Strategy Inventory and the open-ended survey.

Analysis

This is a longitudinal study, so the participants at Level One in the spring (N = 14) and fall 2017 (N = 16) were compared with themselves at Level Two in the fall 2017 (N = 12) and spring 2018 (N = 18). The participants at Level Two in the spring 2017 (N = 18) and fall 2017 (N = 12) were compared with themselves at Level Three in the fall 2017 (N = 16) and spring 2018 (N = 14). An independent sample T test was performed on SPSS 23 to analyze the quantitative data collected from the learning strategy inventory, and the

significant value of $p < .01$ was adopted. To analyze the qualitative data from the interview and the open-ended survey, the researcher used manual coding. Findings are reported below.

FINDINGS

Research question 1: Did the students change their character learning strategies from the time of having no orthographic study assignments (Level One) to the time of having such assignments (Level Two)? If so, what are the changes?

The quantitative analysis of the inventory data showed that the students did not make significant changes in each category of strategies: the strategies used when a character is just introduced, strategies used after a character is introduced, strategies used to memorize, strategies used to practice, and strategies used to preview and review. However, the open-ended survey and interview found that the students at Level Two made four changes.

First, the students at Level Two were more knowledgeable on radicals, and so radical awareness was more involved in their processing of characters. One student stated, "I use the radicals more this semester, thanks to the orthographic study. I memorize characters and their meaning easier." Another student expressed this view, "This year I have focused on the radicals more and it has really helped." The students used radical knowledge to compare characters. One student stated, "I compared characters in radicals and components. This helped me memorize shape and meaning." Radical knowledge-based strategies have been reported in previous studies (e.g., Wang, Liu, & Perfetti, 2004). Second, the students at Level Two used more pronunciation-learning strategies. One student said, "I often use the internet to help me learn better pronunciation," while the other wrote, "Listen to radio and watch/listen to dramas; use sentences and words in speech with native speakers." Another one wrote that he conversed with speakers who are more fluent. Third, the students at Level Two handwrote characters with more repetitions. This change was reasonable because the students at this level started to reproduce words in each quiz which they did not at the previous level. Fourth, the students at Level Two used flashcards more often because they found that this strategy was helpful for memorizing. On one side of the cards was a character(s) and on the other side was pinyin and the English definition. This strategy worked with the objective of the quizzes, that is, to test students' knowledge of form, sound, and meaning. Eighty-six percent of the respondents agreed that their strategy changes were related to the fact they began to have orthographic study assignments and 85 percent agreed that the changes had happened because they knew more characters at Level Two. The above results, while supporting the finding of Shen and Ke (2007) that radical

awareness developed from low to high levels, revealed that orthographic study assignments can boost the use of radical knowledge-based strategies, but the quiz format can influence strategy choice.

The interviews showed that, at Level Two, some students were more able to use orthographic knowledge-based strategies than others. For example, a student said, "for many characters, I know what this means; this is the radical; this is the one I learned before. This reminds me what the character looks like and how I can write it." Another one said, "I try to look at radicals which are helpful, and I often find familiar parts." However, due to the difficulty in digesting the materials, some students could not benefit in the same way from the orthographic assignments. "I don't think I used radical knowledge much because a lot more time was needed to study radicals." Another student stated, "I don't use radicals when I am learning characters unless I really understand the radicals very well." As another student put it, "sometimes it is kind of random, like how you get the meaning with this radical." Gao and Meng (2000) also reported that radicals and components could confuse students because same components appeared in words of different meanings, and also because some different radicals look very similar.

In summary, based on the analysis of the data from the Strategy Inventory, the students did not make significant changes in their strategy use from the time of having no orthographic assignments to the time of having such assignments. However, the interview and open-ended written survey showed that the students having such assignments had better radical awareness and were more able to use orthographic knowledge-based strategies, but such a development did not occur to some others. The open-ended survey also showed that the format of quizzes affected the choice of strategies.

Research question 2: Did the students change their character learning strategies from the time of having orthographic study assignments (Level Two) to the time of having no such assignments (Level Three)? If so, what are the changes?

The quantitative analysis of the inventory data showed that the students did not make significant changes in learning strategies ($p < .01$) from Level Two to Three. However, the open-ended survey showed that the students made three major changes. At Level Three, they used flashcards more often, handwrote characters a greater number of times, and practiced new words in real-world communication more often to develop reading and speaking skills. The students emphasized that more flashcards and more writing of characters were necessary because they had more vocabulary to study at the higher level and had to reproduce the characters in the quizzes. They believed that flashcards helped to memorize shape, sound, and meaning. Besides making more flashcards and writing more times, they incorporated vocabulary study into real communication. One student began to try WeChat and read children's

books since they were "a practical way to use Chinese." Another student used texting to communicate with Chinese people and explained that this was the best way for him/her to improve reading. Another student stated that reading and writing could help him/her to "become fully literate." Yet another student started to engage in conversations with friends because he needed "spontaneous conversations with native speakers" to master pronunciation. Ninety-two percent of the respondents agreed that they made these changes because their knowledge of characters and vocabulary had increased, and 69 percent agreed that it was because they had more time to try new strategies since they no longer had orthographic assignments.

In summary, based on the analysis of the data from the Strategy Inventory, the students did not make significant changes in their strategy use from the time of having orthographic assignments to the time of having no such assignments. However, the open-ended survey results showed that the Level Three students used flashcards more frequently, handwrote characters with more repetitions, and practiced characters and vocabulary in an authentic language environment more often than they did at Level Two.

Research question 3: From most to least, what was the order that each of the groups used the five categories of strategies investigated in the Strategy Inventory (Shen, 2005)?

The results presented the same order at each level (see table 9.1). The most used category of strategies was "when a character is first introduced"; it was followed by "after a character is introduced." The third most used category was "preview and review." The fourth one was the category of memorizing, and the last one was the "practice" category. Two reasons may explain this cross-level similarity. First, the students were finishing the same level of the textbook and had a close, although different, level of vocabulary knowledge, so their learning strategies did not differ radically. Second, vocabulary quizzes required the students to preview immediately after the professor introduced the words briefly, so the first, second, and third ordering was reasonable. However, the open-ended survey showed that the students made heavy use of flashcards to preview and review vocabulary, and engaged in authentic communication to practice vocabulary, so the lower ranking of the category of "preview/review" and "practice" suggested that the students used limited strategies listed in the Inventory and perhaps used more strategies other than from the Inventory.

DISCUSSION

While supporting the findings of some of the existing literature, the present study shed light on the role of orthographic study assignments in influencing

vocabulary learning strategies. Firstly, the study demonstrates that orthographic assignments have a strong impact on strategy choice because they made a difference in the students' capability of using orthographic knowledge-based strategies. The students having the assignments learned to look at strokes, compare similar components among characters, and use character decomposing skills to help memory. This observation suggested that purposeful assignments on radicals are effective and necessary for students as early as in the beginning stage of study.

Secondly, an appropriate amount of orthographic study is important to make assignments effective. The students at Level Two in this study had one to two page-long orthographic studies in each assignment, covering each new character presented in the textbook. However, some students were not able to digest this much radical information, and they did not benefit from the assignments. If these learners were not able to acquire the materials, completing the assignments could have ended up with a mechanical filling of the blanks. Therefore, it is unsurprising that many students at Level Three agreed that the time freed up from the orthographic study assignments allowed them to try new strategies. Shen (2004) suggested that it is necessary to leave students the space to explore personal strategies to make learning individualized and meaningful. The use of an appropriate amount of orthographic study supports this suggestion.

Thirdly, the present study demonstrated that the assessment format has an impact on the choice of learning strategies. The students at Level Two and Level Three had to reproduce characters from memory and so their use of the strategy of handwriting characters repeatedly was more frequent. Moreover, the quizzes required the students to write in pinyin and to identify characters to match English definitions. This requirement promoted the use of sound-form-meaning flashcards. Therefore, while assigning orthographic study, it is better to incorporate assessments accordingly.

IMPLICATIONS

This study yielded at least three pedagogical implications. Firstly, when they use orthographic study assignments as instructional interventions, instructors should apply the Competition Model (MacWhinney, 2001). According to the Competition Model, different linguistic cues compete with each other to be the best one that a learner processes. At the level of shape, semantic radicals, phonetic radicals, and/or perceptual units formulate characters. In applying the Competition Model, instructors should adopt four practices. First, owing to the large number of radicals and units, instructors should first teach the most frequently presented radicals. When the most frequently presented radicals "win" the mastery of the students, the knowledge of these radicals will

have a snowball effect because students can process many more characters building on these radicals efficiently. Second, instructors should present an appropriate number of radicals/components in each assignment. They need to consider the vocabulary pool in the textbooks, but it is not necessary to overwhelm learners by presenting an indigestible amount of information. Third, assignments should repeat radicals/components to help learners to achieve the knowledge. Repeating previously learned radicals in new material is necessary since alphabetic language speakers need to develop a new cognitive structure in learning Chinese (Shen & Ke, 2007); repetition therefore works best in such a slow and incremental progress. Fourth, assessments on radical knowledge will encourage students to apply orthographic knowledge-based learning strategies. Assessments can be written and spoken. In written form, students can identify and/or sound out radicals/components and compare similarities and contrast differences among characters. In spoken form, students can explain to each other the structure of characters, the sound and meaning of radicals/components. In the process of explanation, they will learn from each other and improve their knowledge. Instructors can also assign a student leader to explain the material to the class and rotate leadership among all students throughout the semester. The chances are that student leaders will pay intensive attention to assigned materials, and the materials may become their permanent knowledge.

Secondly, as Shen (2013) suggested that instructional interventions should increase both phonological and orthographic awareness, instructors need to teach students to sound out vocabulary and to provide them with opportunities to practice sounds in speaking tasks. This should be done before distributing print materials for orthographic study. In learning Chinese characters, learners must activate the sound of the characters in order to make learning happen. The activation of sound is at a lexical level, which means that learners must recognize the whole unit of the character in order to sound it out. For this reason, memorizing pronunciation is perhaps more difficult than memorizing shape and meaning (Shen, 2010). Becoming familiar with sounds will free up more cognitive resources for students to focus on the study of shape and meaning. This is particularly necessary for learners who have not yet mastered pinyin pronunciation.

Finally, but importantly, the present study demonstrated that students nowadays have a tendency to practice the target language using digital equipment. Instructors can take advantage of this trend by using digital social networks to boost students' practice. This will promote the use of practice and review strategies in authentic situations. Instructors can set up task-based activities on WeChat for students to practice pinyin and to improve their recognition of characters. However, this cannot replace handwriting exercises since writing in correct stroke order is very effective for memorizing characters.

CONCLUSION

The present study investigated the effects of orthographic study assignments on students' character-learning strategies. It demonstrates that using orthographic study assignments as instructional interventions to develop radical awareness can enhance the application of orthographic knowledge-based learning strategies. It also shows that assessments play an important role in strategy choice, and therefore incorporating assessments into orthographic study will enhance the use of such strategies. The results shed light on the pedagogical implications, such as providing orthographic materials in appropriate sequence and assigning a reasonable workload. Given that the sample size is small, and the data were collected from the classes at one university, the results should be considered as tentative rather than conclusive. Further research should investigate different instructional interventions, and needs to be longer term based. Studies comparing different orthographic study assignments can help to identify better assignments to improve radical knowledge and strategy use, and are therefore definitely necessary.

NOTE

1. Due to the space limit, the Strategy Inventory was not enclosed. Please refer to the article (Shen, 2005) to view the inventory.

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APPENDIX 9.1

Interview Questions

1. Please explain what strategies you often use to study Chinese characters and vocabulary.
2. Are these strategies also most helpful for you? Why or why not?
3. Do you use familiar parts and/or radical knowledge to help your study of characters or words? Why or why not?

APPENDIX 9.2

Open-Ended Written Survey

My first language: _____ My course level: _____

1. Comparing to last semester, please explain what changes you have made in your character learning strategies, for example, using some strategies more or some others less, trying new strategies, etc.
2. Please explain why you have made these changes in your strategy use.
3. The above changes of my strategy use are related to (please choose the answer most true for you):

0 = Not applied 1 = strongly disagree 2 = disagree 3 = agree 4 = strongly agree

a) The fact that I have learned more characters and vocabulary in this semester.
0 1 2 3 4
b) (for Level Two students only) The fact that in this semester I have orthographic study assignments that my instructor counts in the grading of the vocabulary quizzes.
0 1 2 3 4
(for Level Three students only) The fact that in this semester I no longer have orthographic study assignments which I used to have so that I have more time/energy to use some strategies more or try some new strategies.
0 1 2 3 4
c) Others (please explain):

Chapter 10

Exploring Chinese Character Learning by English Speakers through Error Analysis

Lan Zhang

Chinese, being typologically distant from English, has been considered an "exceptionally difficult" foreign language for native English speakers to acquire. In particular, the Chinese writing system is considered to be "one of the most visually daunting and phonologically opaque writing systems" (Kim et al., 2016). The difficulty in learning characters is at least partially responsible for the different expectations by educators regarding the ability of learners to produce Chinese characters. Some teachers consider the ability to input Chinese sufficient, especially considering the prevalence of computers and other communication devices in modern life, which only require the abilities of pronunciation and recognition. However, the majority of the teachers hold the view that, despite the difficulties, students should still learn to write characters. As a distinguished scholar in this field noted at a conference during a discussion on this topic, "I would like for my students to be able to write a note in Chinese when needed" (孙, 2017); the ability to write characters is still necessary.

In contrast to the linear structure of the English writing system, Chinese characters are usually viewed as "square shaped" (方块字), composed of interwoven strokes, the most basic unit of Chinese characters. In terms of structure, Chinese characters can be classified into simple characters (独体字) and complex characters (合体字). Simple characters are those that cannot be divided further into subcomponents. In terms of formation, simple characters can be pictographic, such as 人 "person" or 日 "sun," or indicatives, such as 上 "above" and 下 "below." Such characters are highly ideographic, although not all the logography of the simple characters can indicate their meanings. There is no regularity in the formation of simple characters in the sense that there are no recurring components in different characters. Thus each character

must be memorized individually. Simple characters only occupy a small proportion of Chinese characters and most of them can be subcomponents of complex characters. Complex characters contain two or more meaningful components. Such components can contribute either a semantic cue to the meaning of the whole character or provide a phonetic indication of the character. For instance, the character 林 "woods" is composed of two meaningful components, both of which are 木 "tree," and they contribute to the meaning of the whole character. However, neither component can indicate the pronunciation. Among complex characters, semantic-phonetic compounds (形声字) constitute over 80 percent of Chinese characters (Tong & Yip, 2015). The character 清, for example, is composed of both a radical 氵 meaning "water," which provides a semantic cue to the character, and a phonetic component 青, which shares the same pronunciation with the whole character *qing1*. The components of complex characters demonstrate certain functional and positional regularities. For instance, the radical 氵 always occupies the left position in a complex character and usually offers some basis for inferring the meaning of the character being related to water. 青, on the other hand, when it is in a complex character, often occupies the right position. In addition, it can also appear in the bottom position, such as in the character 菁. Therefore, even though the relationship between the script and its pronunciation is far less transparent in Chinese than in alphabetic languages, the majority of characters contain some form of phonetic cue. Due to language change over time, however, neither phonetic nor semantic cues are always reliable. The complex character 倩 is pronounced as *qian4*, which is not entirely the same as its phonetic cue 青 in this case. In terms of semantic radicals, the character 权 "power" is not obviously related to wood in its contemporary usage, even though it contains the wood radical 木. Shu et al. (2003) investigated the characters explicitly taught in Chinese elementary schools. They discovered that only 23 percent of the semantic-phonetic compound characters were fully regular in pronunciation, while 35 percent are irregular or contain obscure or ambiguous information about pronunciation (table 7, p. 35). Further, only 40 percent of the characters have radicals that are directly related to the meanings of the whole characters, and 33 percent have radicals that are unrelated to the meaning or difficult to define (table 10, p. 38). Thus, even though the phonetic-semantic compounds are the majority of characters, in many cases the phonetic or semantic cues are not entirely reliable.

CHARACTER ACQUISITION IN L1 RESEARCH

Based on these structural and formational characteristics, much research has been done on the acquisition of Chinese characters by both L1 and L2

learners from differing perspectives. A number of researchers have investigated how children acquire Chinese characters and whether they rely on semantic radicals or phonetic cues. Shu and Anderson (1997) conducted two experiments to investigate whether Chinese children were sensitive to the semantic radicals and whether they could use radicals to derive the meanings of new characters when the radicals were familiar. The results show that children performed significantly better on the characters whose meanings are directly related to their radicals than on the characters for which the meanings are not, or only indirectly, related to their radicals. This suggests that the children must have identified radicals and recognized the relationship between the meanings of radicals and the meanings of words containing the radicals. In addition, children rated as good readers by their teachers displayed more awareness of radicals than children rated as poor readers. Thus, the study suggests that poor readers might benefit from explicit instruction in the structure of characters and the functions of radicals.

In addition to semantic radicals, researchers have also investigated whether Chinese children make use of the pronunciation component in their acquisition of characters. It has been found that despite the unreliability of phonetic components being the clue of the characters' pronunciation, Chinese elementary students demonstrated an ability to utilize this information to acquire the pronunciation. Anderson et al. (2003) had second and fourth graders learn groups of unfamiliar characters, including those whose pronunciation was the same as their phonetic components, those in which the pronunciation only varied in tones or initials, and those whose phonetic components were unknown to the children. Therefore, in the last group, the children had no phonetic clue to rely on during their learning process. They learned that the type of character strongly influenced the children's learning of pronunciation, which proved children used the phonetic clue to learn the pronunciation of new characters. This includes those for which the phonetic components vary in tone or initials, and only offered partial information. They further discovered that the information in tone-different characters proved to be readily accessible to children, whereas the information in onset-different characters was only marginally accessible to them. He, Wang, and Anderson (2005) replicated the study by Anderson et al. (2003), and confirmed their findings. Then they examined whether children would demonstrate differences in their performances with characters between those containing bound and free phonetic components. For instance, 青 in 清 is an independent phonetic component since it can be an independent character and have an independent pronunciation. But, there are also phonetic components which cannot be independent characters and do not have independent pronunciations. However, there may be several characters sharing the same phonetic component and are related in their pronunciation. For example, 畐 is a bound phonetic and

occurs in several characters such as 副，福，幅，and 蝠. All these characters are pronounced as *fu,* with only tonal variations. He, Wang, and Anderson (2005) found that children can utilize the information in bound-phonetic characters as well as, or even better than, the information in independent phonetic characters. This suggests that children, as early as second grade, can use an analogy strategy for decoding compound characters. Hu (2013) further finds that phonological and morphological awareness differs in their relative importance at different stages of learning by Chinese children.

To summarize, previous research on character acquisition as L1 has shown that Chinese children, as early as first or second grade, have the ability to analyze the characters into different components, semantical or phonetic, and utilize such components to derive or acquire the meanings and pronunciations of novel characters.

CHARACTER ACQUISITION IN L2 RESEARCH

Researchers investigating Chinese character acquisition by L2 learners may be able to gain insight from L1 research, although L2 learners face an even bigger challenge since their spoken Chinese is also developing. Similarly to L1 learners, it has been found that L2 learners can also acquire the analytical ability of decomposing characters into smaller components, and the knowledge of both phonetic components and semantic radicals facilitate their reading and character learning (e.g., Kim et al., 2016; Tong & Yip, 2015; Wong, 2017). Tong and Yip (2015), using a picture-character mapping task, discovered that learners of Chinese as a foreign language tend to choose pseudo-characters composed of correct semantic and phonetic radicals in correct positions rather than non-characters and unrelated visual-orthographic controls. The research design in these studies usually involves phonetic or semantic processing during character recognition rather than production. That is, such experiments generally do not include a writing task.

Even though a good performance in recognition can be a predictor of a similar performance in production, the two tasks involve different processes. While recognition may only require the learners to know the graphic as a whole, character production requires the learners to know all the character's details and transform that knowledge into a motor skill (Ke, 1996). That said, how do learners learn to write characters? Research on character learning strategies have shown that decomposition of characters is not the most used strategy among learners. Yin (2003), through a survey conducted over three consecutive summers at an intensive immersion Chinese language school, found that the most used strategy by learners, especially at the elementary level, was rote learning. Students preferred repeated copying of the characters

in order to memorize them rather than deconstructing them into their radical or phonetic elements. Ke (1998) also investigated college students' learning strategies of Chinese characters. At the end of the first year, the students' self-evaluation showed that they still felt the need to memorize a character as a whole and to practice writing it repetitively. However, the learners also valued the learning and use of character component knowledge. Shen's (2005) study included learners across different proficiency levels and had similar findings to Ke (1998). She found that orthographic-knowledge-based strategies are most heavily used, which make use of "radical knowledge, graphemics, phonetics and semantics as cues to encode character" (p. 61). She thus suggested that a systematic introduction of orthographic knowledge, especially radicals, to beginning learners will facilitate character learning. This is similar to Zahradníková's (2016) findings. In his study, fifty first-year Czech university students reported their mnemonics used to memorize individual characters over a semester and it was found that learners analyzed the character into smaller components. Further, learners focused more on graphic and semantic information while omitting the phonological information.

In summary, previous research has shown that L1 and L2 acquisition of Chinese characters are similar in that awareness and knowledge of radicals and phonetic cues are facilitative to learning. On the other hand, the self-reported strategies used by L2 learners suggest that students may not be consciously using the deconstruction method of analyzing the characters into smaller components when learning to write. This chapter will investigate students' learning through error analysis in their production of characters in phrases or short sentences. The error analysis approach has been used to investigate how learners discover, understand, and process the target language (Corder, 1982). The analysis of errors produced by L2 learners can reveal their learning difficulties as well as their processing strategies through different learning stages. For instance, Jiang and Liu (2004) examined the character errors occurring in natural writing by thirty-two learners whose first languages were alphabetic. They divided the errors into two major types: one contains characters with graphic errors, and the other is graphically correct characters but used incorrectly due to graphic or phonetic similarities. They discovered that overall, learners made more graphic errors than misusing characters. However, with the expansion of character acquisition, graphic errors started to decrease and the rate for misused characters started to increase. Further, more misused characters were caused by graphic similarity initially rather than phonetic similarity. However, the situation changed when the learners acquired more characters and errors caused by phonetic similarity increased as well. This shows that character acquisition is an "orderly, progressive, and dynamic process" (Zhang & Ke, 2018, p. 125). It should be noted that in Jiang and Liu's (2004) study, even though the first languages of

all the participants were alphabetic, they included not only English and other European languages such as German, but also Asian languages such as Thai and Filipino. Moreover, the learning process occurred in the target language environment. In the current research, the L1 of all the participants is English and the learning occurred in an English environment only. The purpose of the study is to discover the types of errors that occur in learners' character writing and their characteristics, so that the findings may contribute to the discussion of strategies for the effective learning of characters by L2 learners and provide pedagogical implications.

RESEARCH METHOD

Two groups of students of different language proficiencies from a state university in the mid-south of the United States participated in this study. One group comprised first-year students, and the other group was in the second year of their Chinese studies. The data collection occurred throughout the second semester of the academic year. Thus, by the beginning of data collection, first-year students had completed three credits of a Chinese language course, and second-year students had completed nine credits. In order to eliminate confounding factors, students of Chinese descent, as well as students taking both Chinese and Japanese classes, were excluded from the analysis. Eight first-year students and five second-year students' data were analyzed, comprising four male and nine female students. Their average age was twenty-one. They all had English as their first language and had no Chinese language instruction prior to their first year of Chinese study at university.

The textbook used was *Integrated Chinese*, level 1, parts 1 and 2 (Liu & Yao et al., 2009). Four lessons were covered each semester. Before the start of data collection, the first-year students had learned approximately 160 characters, and the second-year students 480 characters. By the end of the semester when the data collection was completed, the first-year students had learned approximately 310 characters, and the second-year students 600 characters. That is to say, during the data collection period the first-year students learned approximately 150 new characters, and the second-year students 120 characters. During each class period the students learned five to ten characters, and character quizzes were conducted in the form of dictation at the beginning of the next class, focusing on the newly learned characters. First-year students were asked to write in phrases, whereas second-year students sometimes wrote in short sentences. This required students to be able to understand the Chinese phrases or sentences they heard and then produce them. Thus, they needed to activate all three linguistic components of a character—sound, meaning, and shape—during this process. Twenty-three

quizzes were conducted through the semester. In total, the first-year students were asked to write 269 characters in their quizzes, and second year had 474. During calculations, if a character appeared twice in one quiz, it was counted as one character. However, if the same character appeared in two different quizzes, it was counted as two characters. There were some students who did not attend all classes and thus missed quizzes during the semester. As a result, the first-year students' data ranged from 195 to 259 characters per person, and the second years' ranged from 438 to 461 characters per person, including characters learned in previous lessons or even previous semesters. In total, the data collected contained 4,082 characters.

ANALYSIS OF TYPES OF ERRORS IN DATA

After examining the data, it was discovered that the first-year students had an overall 25.08 percent rate of error, and the second-year students had a rate of 16.20 percent. Six types of errors were evident.

The first type is that students could not produce the character at all, leaving the space blank or sometimes marked with pinyin only. The factor of visual complexity does not seem to play an important role as such errors contain characters with few strokes. Some examples from first-year students' data include: 年级，备，乐，就，亮. Some examples from second-year students' data include: 旁，忘，往，夜，道，些. These errors contain both simple characters such as "年" and "乐," and complex characters such as "忘," "级," and "道." Among the complex characters, there are phonetic-semantic compounds which contain both reliable phonetic and semantic cues, such as "忘" (亡+心), and others contain either partial phonetic cues or semantic radicals, such as "旁" (方) and "道" (辶). However, such cues were not able to be recalled during the writing task. There appeared to be no pattern as to the kind of characters students could not produce.

It is worth noting that students left fewer characters blank than the characters they produced but wrote incorrectly. Except for one student in the first year who had an equal amount of characters left blank as characters written incorrectly, all the others had a greater number of incorrect characters than blank ones. On average, the first-year students' blank characters are 34.80 percent of the total characters that were not produced correctly, and the second-year students' blank characters totaled 31.25 percent.

The second error type is to use the wrong character. This can be caused simply by the similarity in the shape of the characters. For instance, some students wrote "很" for "跟," "谁" for "准," "边" for "近," "死" for "夜," or "师" for "帅." All these pairs of characters share one common component, or simply look alike in shape, and the students were sometimes confused with either the

semantic radicals or the phonetic cues, or a similar component. This error can also be caused by a similarity in pronunciation. For instance, students wrote "友" for "有" or vice versa, "可" for "课," "问" for "文," "今" for "见," or "书" for "属." These pairs of characters may share the same pronunciation, differ only in the tones, or have the same onset. Student error in this case reveals that they were not able to distinguish the meanings of homophonous characters or characters similar in pronunciation. There are also cases where students misused one character for the other, even though the two do not share any similarity directly, either in meaning or pronunciation. This could possibly be due to the fact that students may have learned the two characters together in one class period, or the two have similar usage. For instance, the word "星期" was written as "期星," "边" for "前," or "里" for "直," since "前" and "边," "里" and "直" were taught together respectively and all four characters could be used for giving directions. To misuse one character for another does not have a high rate of occurrence among all types of errors. The first-year students' rate is 9.03 percent, and the second years' is 13.04 percent.

The third type of error is orthographic (positional) errors of elements. Students misplaced certain elements in a character, and sometimes altered the structure of the character. Thus, even though all the components were present, the characters were not correct. This type of error occurs least, and is not observed at all in the data of first-year students. Among the second-year students, however, only seven cases were observed, which is 1.90 percent of all the error types. One example is the character "前"; a student perceived the radical "刂" to occupy the right half of the character instead of being in the right bottom half position, perhaps analogous with previously learned characters such as "到" and "别." Thus, he wrote the character with a left-right structure: "  ." Two other cases both involved the radical "走." Characters containing the radical "走" are usually of a half surrounded structure. For instance, in the characters "赶" and "越," the components "干" and "戉" were half surrounded by "走," rather than appearing on the right side of the radical. However, there were students who misconceived the two characters as a left-right structure and wrote the two characters as "  "and "  ." Another example involves the character "和." Even though the correct structure was maintained as left-right, the left and right parts of the characters were switched. Two students wrote this character as "  ." Such misplacement of components may have been caused by the fact that a number of characters that students learned have the radical "口" on the left part of the character rather than on the right.

The fourth error type is errors with the radicals alone, which includes having the radical missing, using the wrong radical, writing the radical incorrectly, and, in rare cases, supplying an extra radical unnecessarily. Errors in the components other than radicals, such as phonetic components, are not

included in this category. This is because, compared to components such as phonetics, radicals are usually visually less complex. Furthermore, Chinese contains a limited number of semantic radicals and they have a much stronger productivity than phonetic components. Therefore, the two kinds of components may not be at the same level of difficulty for learners to produce, and are categorized into different groups. Students would occasionally omit the radical, even if it is directly related to the meaning of the character. For instance, for the character "说," a student wrote it as "兑," omitting the radical "讠." More examples of such errors are: "苹" written as "平," without the radical "艹"; "馆" written as "官," omitting the radical "饣"; and "课" written as "果," without the radical "讠." There are also errors where students chose the wrong radical. For instance, the character "练" was written as "炼" with the wrong radical "亻," the character "眼" was written as "眠" with the incorrect radical "日," and the character "听" was written as "讶" with the wrong radical "讠." In a few cases the radical itself was written incorrectly. For instance, the radical "⻊" was not written correctly in the character "路," and was written as "⻂." Another example is the character "物." The radical "牜" lacked a stroke and the character was written as "㓹." Sometimes the radical contains a wrong stroke. For instance, the metal radical "钅" in the character "钟" had the hook toward the left instead of right, and the character was written wrongly as "钟." There is also one case where a student used a radical unnecessarily. For instance, the character "费" was written with a water radical "氵" and written as "潽," even though the meaning of this character has nothing to do with water. The rate of radical errors is 11.23 percent among first-year learners, and 14.95 percent among second years.

The fifth type of error is that related to the phonetic components. Although called phonetic components, some may not provide phonetic cues due to language change. This type of error includes having the component missing or writing the component incorrectly, such as missing strokes, inserting more strokes than necessary, having incorrect strokes, or having an entirely wrong component. For instance, for the character "起," a student was only able to write down the radical "走." For the character "便," only the person radical "亻" was produced. Sometimes, even though the learners tried to write the entire character, the component other than the radical was wrong. For instance, the character "瓶" was written as "瓶," in which the first two strokes were missing. The character "喝" was written as "吅曷," in which the stroke "丿" in the phonetic component was missing. There are also cases of extra strokes being inserted and producing an incorrect character. For instance, "等" was written as "筈," and contains an extra dot at the bottom. In some cases, a wrong stroke was used. For instance, "预" was written as "预." The last stroke should be a dot "丶" instead of "乚." There are also cases where the entire component was wrong. For example, the character "料" was

written as "糕." The right part of the character does not bear any resemblance to the correct character. The rate of such errors on the component other than the radical is 23.79 percent among the first-year students, and 18.48 percent among the second-year students.

The last type of error is that related to the whole character. This includes not only simple characters that were written wrongly, but also includes complex characters in which both the radicals and the phonetic components were wrong. This could be because of omitting or inserting strokes. For instance, a student did not remember the first stroke in the character "乐" and wrote down "㐄." Or the character "在" had the left vertical stroke missing and was written as "𠂇." Sometimes students put a stroke in a wrong position. For instance, a student wrote the character "来" as "釆," mistakenly putting the top line lower than it should have been. If neither component in a complex character is correct, then the error is also included in this type. For example, the character "张" was written as "丐." It bears some resemblance to the radical "弓" but is not correct, and the phonetic component is missing. This type of errors occurred at the rate of 20.26 percent among the first-year learners, and 20.38 percent among the second-year learners.

DISCUSSION

The types of errors and their rate of occurrence in the data of the two groups of learners are summarized in table 10.1.

Among the six types of errors, leaving the space blank and not providing any information on the character appears to have the highest percentage. However, as noted above, closer examination of the data revealed that every student had a higher number of characters that were written incorrectly than not written at all, except for one who had an equal number. This suggests that, even if they were unsure, learners tried to provide some information on the characters rather than leaving a blank.

Student errors on the positional characteristics of different components in a character, which sometimes leads to the change of its structure, occur least in the data. None was observed in the first-year learners, and only 1.90 percent in the second-year learners. This suggests that even after one semester of learning the language, students can gain a good knowledge of the graphic characteristics of Chinese characters and have developed some sensitivity to the positions of each component. The positional regularity of Chinese radicals and phonetic components may have contributed to the relatively quick grasp of such knowledge. This may also suggest that, starting from this early stage, students have acquired the ability to break down characters into components. However, they may not have acquired the knowledge of

the meaning of the radicals or the pronunciation properties of the phonetic components, and how they contribute to the semantics and pronunciations of the characters. Thus, both the first- and the second-year students made more errors on the writing of radicals and phonetic components than placing them in the correct position in a character. Some errors suggest that they were not yet sensitive to the meanings of the radicals, or not able to use the knowledge of radicals to help construct the characters, such as writing "灯" as "仃," or "听" as "斤." Sometimes even when the correct radical was chosen, it was written incorrectly, which reveals that learners have not acquired all the details of the orthography of radicals.

Compared to semantic radicals, the acquisition of phonetic components is even more challenging. This is not only because of the irregularity of their phonetic contributions but also because of the greater number of phonetic components and their low productivity. For instance, He, Wang, and Anderson (2005) noted that out of the 1,850 semantic-phonetic compound characters they investigated, there are 650 different visually complicated phonetics, which makes an average of only three compound characters per phonetic. Such a low productivity also indicates their low frequency of occurrence. Furthermore, phonetic components usually contain more strokes than radicals and are visually more complex. Thus, acquiring the orthographic details of these components is even more challenging, and this is reflected in the higher error rate on the phonetic components.

While the three types of error—leaving the character blank and not producing it at all, errors pertaining to the whole character, and using the wrong character—are related to mistakes in the character as a holistic unit, positional errors of elements and errors on the semantic radical or phonetic components only reflect sensitivity to the different components within a character. In both groups of data, errors related to the character as a holistic unit have a slightly higher percentage than errors related to a component only. The percentages of the holistic unit errors are similar in the data of first-year and second-year students. The first-year students had a rate of 64.09 percent and the second-year students 64.4 percent. This suggests that even though learners are sensitive to the structure of characters and the relative positions of each component, their knowledge of the components of characters is still developing. The limited amount of characters they have learned also indicated the low frequency of occurrence of the components. They were not yet able to abstract the components to help construct and produce characters, which also requires them to master all the details of their orthography. This may explain why students prefer rote learning and writing the characters repeatedly at this stage, as previous research suggested.

Jin (2006), in a study of the effects of multimedia presentation, orthography, and processing experience on Chinese character recognition by learners

with different first language backgrounds, found that among the three strategies (paying attention to radicals, focusing on character stroke sequences, and studying pinyin pronunciation), the learners who worked with the radical presentations performed the best, and the performance of those who worked with the stroke presentation was in turn better than those working with the pinyin presentation. The error analysis in this study suggests that whereas radical knowledge is crucial, stroke presentations are also very important for the purpose of character production, at least during their first two years of study. This is because character production requires learners to know the character in all its details, including each individual stroke and how the strokes interrelate to form the character. Teachers can assist the students to make connections between the characters they have learned and the new characters, pointing out the common components. This can help to facilitate the ability of learners to decompose characters and make learning of the characters more effective. Learning the components may not be easy in itself, as revealed by the error rate in this study. Thus, to demonstrate the strokes in teaching is a necessary supplement, at least at the beginning stage.

SUMMARY

Having introduced the characteristics of Chinese characters, this chapter reviewed previous research on L1 and L2 character acquisition. Then it conducted an error analysis of the character quizzes by first- and second-year college students. The study discovers that even though students have developed some sensitivity to the graphic structure of the characters, they still made more errors related to the characters as a holistic unit. It is suggested that stroke presentations, as well as radical and phonetic component decomposition, are very important in character instruction to students, especially at the beginning level.

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Chapter 11

Using Multimedia-Assisted Materials to Facilitate the Self-Paced Learning of Traditional Chinese Characters

Hsiu-Jen Cheng and Hong Zhan

BACKGROUND

Language is a system of signs and semiotics that combines concept (meaning) and sound-image (Bally & Sechehaye, 1966) which are lividly depicted in Chinese characters in phonological, lexical, syntactic, and semantic elements (Yang, 2014). The Chinese language currently uses two writings scripts. Traditional characters are used in Taiwan, Hong Kong, and many overseas Chinese communities and simplified characters are used in mainland China, Singapore, and Malaysia (Yang, 2009).

Because of the co-existence of these writing scripts, teachers need to choose one form when teaching Chinese as a foreign language (CFL). Because more and more overseas Chinese teachers have been originating from mainland China in recent years, simplified Chinese characters have become the common choice. However, Chinese learners who only learn simplified Chinese characters may become easily confused when employing and encountering Chinese characters in the real world since they cannot recognize street signs or read local Chinese community newspapers that are often written in traditional characters (Zhan & Cheng, 2014). Compared to simplified Chinese characters, traditional Chinese characters retain many pictographic and ideographic symbols of word origins and phonetic-semantic compounds. For example, the character 媽 (mother) contains 女, a semantic component, and 馬, a phonological and pictographic component. Thus, many Chinese educators have suggested teaching traditional characters because they are composed of many signs and symbols that can help

Chinese learners better recognize Chinese characters (Zhang, 2017; Cai, 2011).

To teach both simplified and traditional characters during a constrained class period would increase both the students' cognitive load and the teacher's teaching load. Fortunately, technology-assisted learning materials can overcome this challenge. Previous studies have found that computer and communication technologies, multimedia tools and animations, etc. have played critical roles in character recognition, stroke orders and sequences, and building associations between phonetic, semantic, and orthographic components of Chinese characters (Zhan & Cheng, 2014). More importantly, modern mobile technologies, such as handheld tablets, smart phones, and iPads/iPods, have allowed learners to study Chinese characters in a more personalized, interactive, and communicative way.

To engage students' learning through multimedia materials, the learning materials should allow learners to control the learning pace, order (Mayer, Dow, & Mayer, 2003), and content (Scheiter, 2014). Learner controls can be designed to have different levels. A high level learner control allows learners to freely navigate interactive learning materials and choose content they want to learn, the sequence order in which they want to learn, and how much time they want to invest in learning specific content. A low level learner control is more linear, meaning that users must follow the content sequence to progress. Literature (Teo et al., 2003; Mayer & Chandler, 2001; Mayer, Dow, & Mayer, 2003; Tabbers & Koeijer, 2010) suggests that a high level of learner control enhances the performance and perceptions of learners with advanced prior knowledge in a related area.

Research to investigate the effectiveness of learner controls are mainly conducted in the field of technology education. However, empirical studies about the learner control in teaching characters are very sparse. Therefore, this study investigated how multimedia-assisted learning materials with different levels of learner controls could help Chinese learners who have learned simplified Chinese characters to develop knowledge of traditional Chinese characters. In particular, this investigation sought answers to these four research questions:

1. Do the self-paced multimedia learning materials help students learn Chinese traditional characters?
2. Do learner control levels in the multimedia learning materials affect the learning of traditional characters?
3. What are the strategies CFL learners applied while using multimedia learning materials for traditional Chinese character recognition?
4. How do the learners perceive multimedia materials for traditional character recognition?

LITERATURE REVIEW

Traditional and Simplified Chinese Characters

Initially, Chinese writing took just one form—traditional characters. According to Shuowen Jiezi (說文解字, an analytical dictionary of Chinese characters), Chinese characters are composed in one of six forms: pictographs (象形 xiàngxíng, i.e., 日, 月), ideographic (指事 zhǐshì, i.e., 上, 下), compound ideographs (會意 huìyì, i.e., 困, 囚), phono-semantic compounds (形聲 xíngshēng, 江, 河), phonetic loan characters (假借, jiǎjiè, 北, 長), or derivative cognates (轉注 zhuǎn zhù, 考, 老) (Zuo, 2005). Statistically, phono-semantic compound characters make up about 80 percent to 90 percent of the total number of Chinese characters. Chinese traditional characters are formed more systematically based on the manner in which characters were created or derived (Zhan & Cheng, 2014).

The Chinese writing split into two forms in 1958 when the mainland Chinese government launched Chinese language policies that have since simplified characters by changing or removing complicated elements from their original, traditional form. Although this simplification has historical significance for helping Chinese people on the mainland achieve literacy rapidly, some simplified characters have consequently lost their ideographic and pictographic-phonetic symbols, along with certain semantic representations (Deng, 2009).

The Importance of Teaching Traditional Characters

Since mainland China first launched its language policies sixty years ago to simplify Chinese characters, the new, simplified Chinese characters have been widely used throughout mainland China and Singapore since 1958, while traditional characters continue to be primarily used in Hong Kong, Taiwan, and many Chinese communities overseas. However, a shift occurred after 1980, when more and more mainland Chinese people went abroad. Therefore, simplified Chinese character users have now become more abundant in overseas Chinese communities.

In the CFL field overseas, the debate over teaching traditional or simplified Chinese characters in U.S. schools has lasted for decades (Yang, 2009). Many Chinese scholars have advocated the importance of learning traditional characters in CFL overseas, as well as in elementary curriculums within mainland China (Zuo, 2005; Jia, 2001; Cai, 2011; Zhang, 2017; Li, 2008). Some scholars emphasize the importance of learning the cultural aspects of traditional characters. Yang (2016) states that "traditional Chinese characters are Chinese ethnic symbols" (p. 39) to inherit Chinese culture. Traditional

Chinese art, painting, and calligraphy continue to use written traditional characters for their wise, ethnic, and historic connotations (Yang, 2014).

For most CFL learners, learning Chinese characters is the most challenging task. Studies have found that identifying the origin of character configurations helps students to recognize and write characters more accurately (Zuo, 2005; Jia, 2001). Therefore, some scholars advocate teaching traditional characters for their emphasis on word meaning. When teaching characters by rationales, teachers show their students how characters have been formed and changed from their original pictographs over time. However, some characters in their modern simplified formats may not intuitively relate to their original forms. For example, the character for "love" in traditional form is 愛, which inherently depicts that only wholehearted (心) love is real love. However, in its simplified form 爱, the heart radical has been removed. In this case, the simplified character lost its rich symbolic meaning. Because the formation of traditional Chinese characters is strict and logical, they can best show phonological, semantic, and ideographic connections (Yang, 2014).

Multimedia-Assisted Language Learning and Chinese Characters Learning

Recent relevant studies have discovered that multimedia and animations facilitate character recognition (Jin, 2006; Kou & Hooper, 2004). Kou and Hooper (2004) compared different approaches to learning Chinese characters using a computer-based tutorial designed to teach thirty Chinese characters to non-native Chinese speakers. They found that participants in the dual coding group scored the highest among all the groups in the immediate post-test. The effectiveness of using multimedia-enhanced character learning was also supported in Jin's study (2006), which investigated the effects of multimedia presentation, orthography, and processing experience on Chinese character recognition. The results of the immediate recall task showed that computer-based multimedia helped CFL learners (regardless of their language backgrounds) more effectively recognize characters compared to the traditional printout group. Within the same multimedia groups, radical presentation was performed best, followed by stroke presentation, and pinyin. A more current study (Sharma, 2013) concurred that students' achievement and retention were better in interactive multimedia learning than in conventional methods. Because character recognition is fundamental in developing reading and writing skills, these research findings demonstrate the importance of using multimedia materials in learning, as well as, teaching Chinese characters. However, the use of multimedia to teach traditional characters is still a relatively new area.

Learner Control

Giving students more control is one pedagogical strategy of a learner-centered teaching approach. According to Doyle (2011), when learners have meaningful choices in what and how they learn, they have the best opportunity to engage, participate, share, and work toward the learning goal; thus, the learning process and results will improve. New research confirms that having some authority over how one takes in new information significantly enhances one's ability to remember it (Voss et al., 2011). When learning with web and multimedia materials, learners can perform better if they have control over the learning pace, sequence order (Mayer, Dow, & Mayer, 2003), and content (Scheiter, 2014).

Previous studies have found that the level of learner control in multimedia materials affects learning satisfaction and retention. In Fisher's 2010 study, for example, out of 119 participants, 8 students who chose a low level of learner controlled learning materials were not as satisfied with the course as the 111 participants who chose a high level of learner controlled learning materials.

The level of learner control also affects retention, especially for online learning. Research has found that learners exhibit better problem solving skills when they have the authority to decide their learning pace and sequence (Mayer & Chandler, 2001; Mayer, Dow, & Mayer, 2003; Tabbers & Koeijer, 2010). This means that learners can break down information into digestible segments at their own pace and move on to the next stage of learning when they are ready and without carrying a heavy cognitive load.

Chinese-Character Learning Strategies

For most CFL learners, learning Chinese characters is the biggest obstacle in their Chinese learning advancement. If CFL learners do not overcome this obstacle, they can become very frustrated and even quit learning Chinese (Sung, 2014). To ease CFL learners' struggle, many Chinese educators have conducted studies to discover effective Chinese character learning strategies. Sung conducted comprehensive research related to Chinese character learning strategies in 2014. This study investigated students' self-reported character learning strategies and discovered the relationship between those strategies and learners' performance as assessed in a Chinese character test. The study found twenty strategies that learners used frequently when learning Chinese characters in five stages: (1) when characters are first introduced; (2) when increasing understanding of newly introduced characters; (3) when memorizing newly learned characters; (4) when practicing new characters; and (5) when previewing or reviewing new characters. The study also found that the strategies students adopted in their learning were related to their

satisfaction with the learning process. The top three frequently used strategies identified in Sung (2014) were: (1) repeating characters multiple times aloud or silently; (2) writing down characters (or words); and (3) paying attention to the use of the characters (or words) in context.

A different study conducted by Zhan and Cheng (2017) investigated Chinese character learning strategies when students employed self-paced multimedia learning materials to learn Chinese radicals. The top three self-reported strategies frequently used by the students were: (1) writing radicals repeatedly; (2) looking at the radicals and corresponding English meanings; (3) writing radicals and their corresponding pinyin. Since the radicals used in this study were complete words (e.g., 木 [wood]), both a radical and a word), strategies for learning Chinese radicals could be viewed as strategies for learning Chinese characters. All the strategies evaluated in the aforementioned studies were geared toward learning simplified Chinese characters. Thus, a knowledge gap exists on the effective strategies for learning traditional Chinese characters.

This literature review has explained how traditional Chinese characters contain Chinese language roots and culture. Teaching traditional characters is important for CFL learners to learn written language and culture. Self-paced multimedia materials have been found effective in teaching simplified Chinese characters, and their level of user control has been found to influence both learner satisfaction and learning results. However, it is still unknown how multimedia learning materials affect traditional character recognition. This research aims to bridge the gap in the existing literature on how Chinese learners familiar with simplified characters can also learn traditional characters via self-paced multimedia-assisted learning materials.

Research Methodology

Researchers conducted an experimental study to investigate the above research questions. Due to the small sample size of this study, a mixed method was applied, including quantitative data generated from students' three pre- and post-test scores of a repeated measured design, and qualitative responses to student interviews.

Research Participants

This study was conducted at a southwestern private university in the United States during the 2017 fall semester. Using convenience sampling methods, researchers recruited eleven participants from an intermediate level Chinese course where students had learned around 700 simplified Chinese characters. A demographic survey was administrated at the beginning of the research to

seek information pertaining to participants' length of Chinese study and prior knowledge of traditional characters.

Based on the survey responses, 73 percent of the participants had been learning Chinese for one year and 55 percent were aware of the existence of two written styles of Chinese. However, only 18 percent of participants could distinguish between the two forms.

Research Design and Process

Based on the concept of learner control, the researchers designed two types of materials—those materials with a low level of learner control (LC) that provided a linear-based navigation mode, and those with a high level of learner control (HC) that provided a web-based navigation mode. The learning materials include six units that corresponded to the first five lessons of *Integrated Chinese (IC) Level 2 Part 1,* the textbook the participants had been learning from at the time of the study. Lesson 5 has too many traditional characters, so two units (Units 5 and 6) were designed for the participants to learn the characters in Lesson 5. Some single character radicals were also whole words, with semantic meanings, e.g., 車 (car), so Units 1 and 2 included five to six whole word characters. Students learned less than fifteen traditional characters at a time for the other units. Table 11.1 below specifies the learning material design.

The participants studied the learning materials at their own pace, three days per unit for six continuous weeks. The participants completed a pre-test before receiving the learning materials, and a post-test after learning with the materials. At the end of the sixth week, students participated in an online interviewed to express their opinions on their learning experience (see table 11.2).

Research Instruments

Survey

An online survey seeking information on participant demographics and their prior knowledge of traditional Chinese characters was administrated at the beginning of this study. The survey questions include: *what is your name*, *how long have you learned Chinese*, *do you know Chinese characters have traditional and simplified versions*, and *can you tell me anything you know about traditional Chinese characters*.

Interview

An individual, structured interview with thirteen questions (listed in table 11.3) was conducted in Chinese via online video conference technology at

the very end of the study. The participants responded to the questions in English or Chinese. Responses from the eleven participants were collected and transcribed. The questions were classified into three categories: learning strategies (survey questions 1 and 2), awareness (survey questions 3 to 8), and perception (survey questions 9 to 13). Learning strategies refers to the strategies the participants used while studying the materials and time they spent on the learning materials. Awareness refers to the participants' awareness of the differences between the LC and HC learning materials. Perception refers to students' opinions toward the learning materials. Data collected from the interview were analyzed to answer research questions 3 and 4.

Pre- and Post-Test

Six sets of pre- and post-tests with the same questions were administered to the students to assess their prior knowledge of traditional characters and their learning outcomes after using the self-paced learning materials. Each test assessed student learning in phonological, orthographical, and semantic aspects. Each test was composed of three parts: pronunciation (pinyin), recognition, and translation (see figure 11.1). In the pronunciation section, students wrote down pinyin for each character. In the recognition section, students matched traditional characters with their simplified counterparts. In the translation section, students translated given sentences written in traditional characters. By the end of the study, most of the six pre-tests and post-tests from eleven American students were collected. However, student MB did not participate in pre-test 4 and student MD did not partake in post-test 6. Two students (OD and KS) did not partake in pre-test 5. Therefore, data were missing from three pre-tests and one post-test data. The total number of pre-tests was nine, and eleven for post-tests.

Design of Multimedia-Assisted Learning Materials

The multimedia learning materials created in PowerPoint and online video tools aimed to assist participants in learning traditional characters. The learning content, that is, the characters in this study, was taken from the first five units of the participants' textbook to avoid increasing participants' learning load. A total of eighty-four Chinese characters with both simplified and traditional forms were included in the learning materials and the characters were divided into single and compound characters. Single characters are the smallest semantic units often used as radicals, for example, 車 (car), whereas compound characters contain more than one orthographical component, for example, 較 containing 車 and 交.

The multimedia learning materials, irrespective of learner control level, included the following components: user guide, homepage, index page, content page, comparison page, formative exercises, summative exercises, and exercise feedback. As depicted in figure 11.2, *user guide* aimed to explain the design and

use of the materials. *Home page* included three navigation panes to pages of single characters, compound characters, and reading practice (see figure 11.3). The index page listed characters to learn in each unit (see figures 11.4 and 11.5). *Content page* illustrated all phonological, orthographical, and semantic information about a character. The differences between simplified and traditional characters were highlighted in red (figure 11.6, figure 11.7 and figure 11.8).

When learners finished learning a character, a formative exercise was provided. The formative exercise challenged learners to distinguish traditional characters from 1) authentic materials, such as advertisements or forms, or 2) a given list (see figures 11.9 and 11.10).

Once learners finished learning all the characters in a unit, they could progress to a summative exercise (see figure 11.11) that required them to read a passage in traditional characters. An answer page and a page which shows the answer in simplified Chinese characters were provided following the practice page so that learners could check their learning outcomes accordingly.

The learning materials differed in their level of learner control. Materials for units 1, 3, and 5 were LC learning materials, whereas materials for units 2, 4, and 6 were HC learning materials. The materials differed mostly in their index pages, comparison pages, and summative exercise (reading) pages. In the index page, with the exception of audio buttons to pronounce a given character on-demand, LC materials only allow learners to proceed in a linear fashion by clicking "next" to view the content information of each character and complete associated exercises (see figure 11.12, left side). In contrast, HC materials allowed learners to interact with the content and navigate freely (see figure 11.12, right side).

On the LC comparison page, the differences between the two-character forms were presented in red (see figure 11.13, left side). However, on the HC comparison page, learners could click on a magnifier icon to highlight the differences in red on demand (see figure, 11.13 right side).

On the LC reading page, learners clicked the "next" button to check their answers in simplified Chinese followed by an English translation page (see figure 11.14, left side). Whereas on the HC reading page, learners clicked the "next" button to check the answers, which were displayed in red in two forms. Those red characters were clickable to toggle between a character's simplified and traditional forms (see figure 11.14, right side).

DATA ANALYSIS

Performance of Traditional Chinese Character Learning

To determine students' learning outcomes pertaining to traditional character recognition, a *t* test was first applied to examine the differences between LC and HC pre- and post-tests. Overall, students' post-test grades exceeded

their pre-test scores (see table 11.4). The average LC post-test score was 87.9, compared to 89.8 for HC. Pre-test scores averaged 50.22 for LC and 51.3 for HC. Regardless of control levels, post-test scores were significantly higher than pre-test scores, as shown in table 11.4 (t lower=–6.6, p<.05; t higher=–.52, p<.05). This demonstrates that the multimedia-assisted material offered by the researchers helped students to learn traditional Chinese characters successfully.

The researchers further examined differences among LC and HC post-tests by calculating a t test. These results showed HC post-test scores (89.8) are higher than LC scores (87.9), but no significant difference (p>=0) between them. This suggests that levels of learner control did not influence students' learning in this study.

The researchers analyzed the post-test scores on three aspects of traditional character learning—1) *Chinese character form recognition*, 2) *pronunciation*, and 3) *meaning of the traditional characters*—by calculating t tests respectively (see table 11.5). They found statistical differences between LC and HC post-test scores regarding Chinese characters form recognition and meaning (t recognition =3.6, p<.05; t meaning=–2.28, p<.05). Regarding recognition, the average LC score (37.5) was higher than the average HC score (32). This result indicates that students performed better at traditional character recognition when using LC materials. Regarding the meaning of traditional characters, HC scores (33.2) surpassed LC scores (27.7), suggesting that the HC material design helped students to remember character meanings better than the LC design. In terms of pronunciation, students' HC post-test scores (pronunciation=25.8) were higher than their LC scores (pronunciation=24.9), but the researchers found no significant differences (t pronunciation=–.33, p>.05; t meaning=–2.28, p>.05).

Overall, the results of the t tests showed that the multimedia-assisted materials created by researchers of this study helped simplified Chinese learners learn traditional characters, regardless of their control levels. Both designs proved beneficial for traditional character learning. LC materials helped more with traditional character recognition, and HC materials helped more with recalling the meaning of characters in context.

Students' Learning Strategies

Character learning strategies were observed in two regards: 1) time spent with the learning materials, and 2) the specific methods students used to learn the traditional characters. Data related to character learning strategies were collected from the online interview. According to student self-reported data, time spending on learning the materials is different, varying from ten minutes to one hour. 27 percent of students spent ten to twenty minutes, twenty

to thirty minutes, and thirty to sixty minutes respectively. Only 9 percent of students spent one hour learning the materials.

Data collected from the interview showed that students used the following learning strategies when they were studying traditional characters with the multimedia materials: using comparisons (see figure 11.13) to check differences among two forms (64 percent); writing down characters (27 percent); checking character meaning (18 percent); and completing exercises (9 percent). In sum, more than half of the participants spent time on the comparisons, and less than a third of them wrote down the characters. Very few students browsed character meanings or completed exercises.

Students′ Awareness of the LC and HC Design

Students were asked seven questions about the deliberate design differences for *LC and HC designs, navigation buttons*, *index slides*, and *comparison slides* (see tables 11.6 and 11.7). Table 11.6 indicates six students (55 percent) had noticed the LC and HC design differences. In particular, when asked if they noticed the different buttons on the right side of the slide, five (45 percent) students answered "Yes" and slightly more than half did not (N=6, 55 percent). Regardless of their awareness, more than half of them had used some of the buttons (N=6, 55 percent). Six students answered this question. Two (JF and AV) used the home page and next page buttons the most. MB used the next page button often. DM used the practice page button and MD used index page button the most. The researchers followed up with those who did not use the buttons to navigate the material, further inquiring "did you view the material in the linear mode?" Most of those learners (N=9, 82 percent) answered that they had viewed the material page by page or sometimes spent more time on the index or comparison pages.

Regarding the index slides and comparison pages, table 11.7 illustrates that six students (55 percent) had noticed the index design differences, while five students (45 percent) did not. Six students (55 percent) used the "GO" buttons/gray textbox of the HC page to check the differences between Chinese characters, but five (45 percent) students did not. Regarding the comparison page, ten students (91 percent) noticed the differences, while only one student (9 percent) did not. These results correspond to students' learning strategies identified the survey, in which 64 percent of students reported that they spent more time on the comparison pages. Obviously, the different design on LC and HC naturally increased their awareness of the design discrepancies.

Students′ Perceptions toward the Self-Learning Materials

The two questions associated with student perceptions toward these multimedia material were: 1) *In terms of recognizing Chinese traditional characters,*

which material (low-level/high-level) helped you remember the traditional characters best? Why? 2) *Which material do you prefer to revisit when you want to learn traditional Chinese characters? Why? (low-level, high level, Both, No difference).*

Helpful

Table 11.8 shows that six students (55 percent) thought LC materials helped them to remember the traditional characters the best; four students (36 percent) thought LC material was more helpful, and one (9 percent) thought both were helpful. Data indicate that half of the students still preferred the multimedia-assisted material with less interactivity.

Revisit

The researchers further asked which materials participants would revisit when learning traditional characters. Six students (55 percent) chose both LC and HC materials. Three students (27 percent) voted for LC materials and two (18 percent) voted for HC materials. This result indicates that half of the students perceived both materials positively and less than one-third preferred LC.

When asked whether they like the materials employed in this study, all of participants indicated that they liked the materials regardless of design variations in learner control. This finding suggests that students positively perceived the materials overall because they felt the materials were helpful for learning traditional characters (MB, MD, and OD); easier to navigate (FG); easier to compare the two forms (ZH, CH, JF, DM); helped them to learn all of the traditional characters from the textbook (AV and KS); and were the most effective way to learn (KM).

1. *Helps me to learn traditional characters.* (MB, MD, and OD)
2. *Good to use to go through and see the differences on the characters.* (JF)
3. *Helped me to remember the traditional characters much better and easier and helped me memory longer.* (FG)
4. *Because it shows the differences for next to each other. Between each traditional and simplified so it was easy to see the differences.* (ZH, CH).
5. *Helpful, it was like the most effective way for us to learn stuff.* (KM).
6. *I can focus on differences easier.* (DM)
7. *I like them because there're all traditional characters I needed to know.* (AV, KS)

DISCUSSION

This study explored the effectiveness of using self-paced multimedia-assisted learning materials to facilitate traditional Chinese character

learning of CLF learners with simplified characters knowledge. Based on the survey results and interview analysis, the researchers found that these materials facilitated learning, regardless of the level of learner control. LC materials helped students better recognize traditional characters, and HC materials helped them better understand traditional characters' meanings in context. Furthermore, this study investigated student learning strategies employed when learning traditional Chinese characters. The results showed that checking the differences between the two written forms was the top strategy (64 percent), followed by writing down the characters, and checking their meaning. Regarding the learners' perceptions of the LC and HC learning materials, more than half preferred LC for traditional character learning.

Multimedia-Assisted Materials Promote Character Learning

After studying with the multimedia materials for six weeks, students' performance in traditional Chinese character learning had improved significantly. From interviews, all students thought the materials were very helpful. Based on these findings, the researchers suggest that CFL teachers offer self-learning materials for students to study traditional Chinese characters after class. This effort can help students become proficient in both character forms without exhausting precious class time. When designing self-paced learning materials, designers should emphasize the differences between the two written styles. Learning content is best associated with the class curriculum to avoid increasing students' work load unnecessarily.

LC Design Helped Students Recognize Traditional Chinese Characters

In the post-tests, students did well on traditional character recognition in both LC and HC. Moreover, their post-test grades on LC were significantly higher than HC. This finding is consistent with existing literature (Moos & Azevedo, 2008) stating learners with advanced prior knowledge outperformed more in a high-level user control digital learning environment over learners with less prior knowledge.

Participants in this study had been learning simplified Chinese characters for more than one year, and their overall language skills had reached an intermediate level. However, these participants' prior knowledge of traditional characters was very limited. Survey results showed that 55 percent of the participants knew Chinese characters have two forms; however, only 18 percent could tell the difference between these forms. The participants who have very limited prior knowledge of traditional characters preferred multimedia-assisted materials with less learner control design, so they could

focus on the learning content. From this perspective, this finding corresponds to the literature (Teo et al., 2003; Mayer & Chandler, 2001; Mayer, Dow, & Mayer, 2003; Tabbers & Koeijer, 2010) explaining that a low level of user control enhances the performance and perceptions of learners with less prior knowledge in related area.

HC Design Helped Students Remember Meanings of Traditional Characters

In the high-level post-tests, students did significantly better on translating the meaning of traditional characters in context. This means that when students read the traditional characters, they were able to easily remember or interpret the meaning of traditional characters in context, perhaps due to their prior knowledge of many simplified characters. According to Cai (2011), although traditional and simplified Chinese characters are different writing scripts, only 496 traditional characters different completely from their simplified counterparts. Most traditional characters have the same or similar orthographic forms. Therefore, if a student knows a simplified character, it is easier to understand the meaning of some traditional characters in a text. This study has also shown that memorizing the English meaning is not challenging for CFL learners who are native English speakers. Therefore, HC design materials helped them performed better, which concurs with existing literature that HC helped learners with high prior knowledge perform better.

Traditional Character Learning Strategies

The top three strategies students in this study employed when studying traditional character with the self-paced multimedia-assisted learning materials were (1) understanding the differences between the two forms, (2) writing down the characters, and (3) memorizing their English meanings. Due to spending extensive time comparing character two forms, participants excelled at learning Chinese, recognizing character forms, and memorizing their meanings. These findings correspond to Sung's (2014) findings in repeating and writing characters. In addition, the finding of this study uncovered a unique strategy for learning traditional characters—comparing differences between simplified Chinese characters and traditional characters.

Thus, the researchers conclude writing down characters is the most common self-learning strategy for Chinese character learning. However, comparing the writing script differences is the most commonly used learning strategy for CFL learners familiar with simplified Chinese characters when attempting to learn traditional characters.

Students Viewed Materials in a Linear Mode and Spent More Time on the Comparison Slides

Based on students' responses regarding their learning strategies and awareness of the learning material designs, the researchers found that participants mostly spent less than an hour with this material. 90 percent of them viewed the material in a linear mode regardless of their interactive capabilities. In accordance with the learning strategies employed, half of the students remained on the comparison pages longer to check the character difference and were consequently aware of the deliberate design discrepancies.

Students Positively Perceived the Self-Learning Material

Interestingly, half of the students in this study personally preferred the LC design materials, but also appreciated the HC materials and would enjoy the option to revisit both materials when learning traditional characters in the future.

RECOMMENDATIONS

In reality, not many Chinese teachers have sufficient time to teach both character forms to CFL learners. Therefore, these learning needs are commonly a neglected instructional issue. The findings of this study prove that learners can learn different Chinese character forms effectively when provided with self-learning multimedia-assisted materials. Two conditions to ensure learning effectiveness are that the learning content should complement the course curriculum, and the learning materials should illustrate the differences between the two writing forms clearly.

In terms of the user control levels of the multimedia materials, students without knowledge of traditional Chinese characters, despite having learned simplified characters for more than a year, would benefit more from multimedia-assisted materials with a LC design, so they can spend more time understanding the content instead of being distracted by interactive features. HC materials helped the American students in this study remember English meanings due to learners' prior knowledge of simplified characters and native English fluency. Therefore, when teachers are selecting materials of proper user control levels, they should consider students' learning objectives as well as their prior knowledge of the learning content, rather than their language proficiency levels.

The results of this study provide meaningful information for CFL educators and learners to teach and learn traditional Chinese characters. However,

some limitations can be improved in future research. First, the sample size of this study is very small, and the convenience sampling method was not rigorous enough. These limitations in the research design affected the data analysis. Second, the participants of this study were all American college students, so the research results cannot represent all CFL learners. Last, the participants had been learning Chinese language for more than one year, so their overall Chinese language skills were still not sufficient to handle the challenging learning tasks well.

Regarding suggestions for future studies, first and foremost, a large-scale research study with more participants of various mother tongues should be conducted to determine if there are any differences among these CFL learner populations. Second, students with more advanced Chinese proficiencies should be studied to see whether they benefit from and prefer learning materials designed with more high-level interactions.

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Chapter 12

Which Is More Effective: App Game or a Workbook?

An Experiment on Learning Chinese Character Writing

Xiaoshi Li and Wenying Zhou

Chinese characters are crucial for Chinese language learning, because character recognition and production are the foundation of developing reading and writing skills in Chinese (Shen, 2004). A Chinese character is formed by putting together specific sets of strokes, ranging from one to as many as twenty-four (Tsai, 2014). The strokes are the most fundamental writing unit, and different combinations of basic strokes can form various internal components such as radicals and different characters. For each character, the sequence of strokes is conventionally fixed and they have to be written in a precise order. Therefore, knowing the stroke order is important in learning to write Chinese characters. Chinese L1 research shows that stroke knowledge contributes both concurrently and longitudinally to children's Chinese character performance (Chen & Kao, 2002; Lo et al., 2015) and it is an important indicator for Chinese character reading and writing ability (Shen & Ke, 2007).

However, writing Chinese characters has been found to pose the greatest challenge for learners of Chinese as a foreign language (Everson, 1998; Ke, Wen, & Kotenbeutel, 2001), especially for learners with alphabetic language background (Shen, 2004). The difficulty lies in the logographic writing system, which is completely different from the alphabetic writing system that is consistent with its spelling system. As Nation (2001) stated, the learning load increases for learners of Chinese whose native language is not closely related to the second language. Given that Chinese character learning requires learners to be able to retain and retrieve a character on three dimensions—the shape, the sound, and the meaning—(Shen & Ke,

2007), logographic handwriting involves the analysis of the character form, rote memorization of each stroke, and kinesthetic skill training (Tsai, 2014). However, the inconsistency between the shape and the sound creates a huge barrier for Chinese L2 learners to memorize, and the stroke order rules add to the difficulty.

Traditionally, Chinese L1 children learn to write characters through rote repetition and memorization (Fan, Tong, & Song, 1987; Packard et al., 2006). This is also the case in Chinese foreign language classrooms where character writing is usually covered in a few introductory classes including the logographic principles of Chinese characters, stroke sequences, radicals, and character structures. Then learners are assigned character worksheets to practice copying in their leisure time, which show the character pinyin and number marked stroke sequences. Instructors usually collect the worksheets to grade on a weekly, biweekly, or even monthly basis. According to Allen (2008), first-year learners self-reported spending roughly one-third of their study time on character writing on average. However, the results did not seem to pay off. Much of the time spent on this one skill and character writing remains the most difficult aspect of Chinese learning. When instructors grade the character worksheets, they are not able to tell whether the correct stroke orders are followed. In class, when instructors see learners write characters, they usually tend to be very lenient: as long as the characters look correct, instructors do not correct the stroke order errors strictly due to the limited class time and unwillingness to frustrate the learners too much. This is rather ineffective for both learners and instructors because students are not able to get immediate feedback and repetitive copying on paper is by no means a motivating task. The much time spent on writing on worksheets by learners and grading by instructors does not yield expected results.

MULTIMEDIA EFFECT ON LEARNING CHARACTER WRITING

In recent decades, with the development of technology, there has been a rapid increase of the availability of computer-assisted pedagogical tools such as stroke sequence animation programs, interactive programs that can analyze errors, or even systems with 3D virtual teachers to help learners with mastering character writing (Jin, 2003, 2006; Leung & Komura, 2006; Tsay & Tsai, 1993; Zhu & Hong, 2005). Technology has the feature of making Chinese character writing effective, fun, and engaging. Dörnyei (1996) expressed that instructors should make learning stimulating and enjoyable in the language classroom because people are usually willing to spend more time learning the content they enjoy. In addition, effective Chinese character learning strategies

can maximize learners' language performance and reduce their learning frustration (Sung, 2014).

However, empirical studies investigating the effect of these multimedia tools on learning character writing in L2 Chinese are very scarce. The related studies so far have shown that the incorporation of technology is more effective than the traditional worksheet method. For example, Tang, Li, and Leung (2006) investigated the effect of their multimedia Chinese character writing program that provided both visual demonstration and customized feedback with a between-group design. Their results found that the experiment group with multimedia assistance learned character handwriting faster than the control group who only had teacher guidance in class. Tang and Leung (2006) furthered the investigation and found that character learning was faster with multimedia customized feedback than general feedback. The similar positive findings were also evidenced by theory-grounded studies such as Tsai, Kuo, Horng, and Chen (2012) and Tsai (2014) that investigated the effect of interactionist-based computer-assisted multimedia Chinese character learning programs on university students' Chinese character recognition and production. Adopting pre- and post-test design, Tsai et. al (2012) compared the multimedia program with the traditional workbook method with two groups of participants: eighteen novice learners with no prior Chinese learning experience and sixteen first-year students of Chinese with six-month exposure to character writing. The multimedia program provided animated demonstrations of the characters and immediate error feedback including spatial relationship error and stroke error. Learners needed to write the character correctly five times before moving on to the next one. The workbook task represented what was practiced in Chinese foreign language classes, that is, asking learners to copy the character five times following the character example and its number marked stroke sequence. The pre-test confirmed all the characters were new to the participants. The post-test included recognition, production, and awareness parts. The recognition test was asking the learners to provide the English meaning of the character. The production test was asking the learners to write out the character out of memory based on the pinyin and English meaning given. The awareness test was asking the learners to handwrite the character given on a sheet. Students' productions were measured according to approximate production (overall shape of the character approximate to the correct form), precise production (correct character with correct stroke sequence), and awareness (correct form with correct stroke sequence). The results indicated that the multimedia program enhanced the participants' precise character production and awareness of character conventional formation significantly. Adopting a within-group design with 167 first-year learners of Chinese, Tsai (2014) conducted a much larger-scale study, examining the effect of the same multimedia program used in Tsai et. al (2012) on Chinese

character recognition, production, and formation awareness and in the meantime, exploring the effect of feedback in the multimedia program. The results detected the multimedia effect not only on character production but also on reducing error variations of character formation. Although the effect of writing feedback did not show in the multimedia program when compared with its counterpart without feedback in the computer-assisted program, the immediate feedback that the learners received had positive influences on their writing motivations and learning objectives. In addition, learners' awareness of the internal character formation was found to be correlated with their recognition and production performance. In line with the above studies, Kang (2014) compared two writing modes (computer-based and paper-based) of beginning-level and intermediate-level Chinese learners, and found that they wrote Chinese essays better with paper-based writing in terms of writing clarity and organization, while computer-based writing only helped them produce fewer character errors. In addition, following correct stroke sequences facilitated them in producing correct characters.

CHARACTER DENSITY

Besides the difficulty of stroke rules, character density (or character complexity) also influences students' mastery of Chinese characters. Character density refers to the number of strokes in a character. The concept was defined differently in different studies (Hayes, 1987; Ke, 1996, 1998; Sergent & Everson, 1992; Xiao, 2002). Hayes (1987) categorized character density into four levels: Low (one to five strokes), Medium (six to ten strokes), High (eleven to fifteen strokes), and Complex (fifteen or more). Sergent and Everson (1992) used seven as the cutoff number of strokes to define high versus low density, whereas McEwen (2006) used eleven as the cutoff number but his study included traditional characters. Ke (1996, 1998) used the mean number of character strokes in recognition and production tasks to characterize character density (Low: recognition – 5.8/production – 4.73; high: recognition – 13.8/production – 12.2). Xiao (2002) characterized character density into three levels: low (one to six strokes), mid (seven to eleven), and high (twelve and above) and the characters in her study were traditional characters.

As for the effect of character density on Chinese character learning, the results are inconsistent. Chin (1973), Sergent and Everson (1992), and Xiao (2002) found density plays a significant role in character learning, but Hayes (1987) found the opposite. Ke (1996) and McEwen (2006) found density effect on character production but not on recognition. Chin (1973) was one of the earliest studies that examined the role of character density in Chinese L2 beginning learners' character recognition and written recall as well as the

relationship between character recognition and production. It was an informal small-scale classroom practice study. Two sections of beginning Chinese classes participated in the study, with one being the control group who had to practice writing characters while learning to recognize them, but the other being the experiment group who only needed to learn character recognition. By the end of the semester, fifty characters of different levels of character density were randomly picked from the textbook and the participants were tested on recognition and production. They found that students' performance declined as the character density increased and the control group performed better than the experiment group in both production and recognition. Also, the control group performed better in both recognition and production than the experiment group, showing that recognizing and writing characters are two related skills rather than independent ones. With proficient learners as participants, Hayes (1987) investigated density effect on character recognition. He showed them a four-second slide presentation of characters and then asked the learners to match the characters that they thought they had seen in the presentation to characters shown on an answer sheet. The study detected no character density effect. Sergent and Everson (1992) explored the character density effect on character recognition speed and accuracy by first-year and third-year learners of Chinese. The learners sat in front of the slide viewer and pronounced each character shown as quickly and accurately as possible. Their accuracy and reaction times were recorded. The results showed that low-density characters were named significantly more quickly and accurately. Ke (1996) adopted a panel study design and investigated character learning by the same group of first-year Chinese learners with the same instrument across two time points with one semester of instruction in between. He explored the density effect on both character recognition (writing both meaning and pinyin of given characters) and production (writing characters of given pinyin and meaning). For both Time 1 and Time 2, the learners performed better in producing low-density characters than high-density characters but their performance in the recognition task was not significantly different. Xiao (2002) examined the density effect on character dictation in addition to recognition and production by forty-seven first-year learners of Chinese. The recognition task was requiring the students to provide the pinyin and English meanings of the characters given. In the production task, the students were expected to write out the characters with pinyin and English meanings given. In the dictation task, the students were supposed to write out the character, pinyin with tone marks, and English meanings after listening to the instructor. She found that character density played a significant role in all the three tasks. With fourth- and fifth-semester learners and using traditional characters, McEwen (2006) investigated the relationship between character density and vocabulary recognition and production. The recognition task was giving the participants fifteen low-density and fifteen high-density vocabulary

items (taken from the students' learned textbook) that were put in sentences or paragraphs with pinyin provided. The participants were supposed to write out the English meanings for the vocabulary items. With another set of fifteen low- and fifteen high-density words, the production task was asking the participants to fill in the blanks in sentences with the words needed but with pinyin and English meanings given. He found significant effect of character density on character production but not on recognition.

While the above studies focus on the correlation between character density and character recognition and production skills, few studies have investigated the effect of character density on students' stroke order learning, which this study aims to investigate.

RESEARCH QUESTIONS

The above brief review has found the advantages of computer-based tools in Chinese language learning; however, there have been few studies that focus specifically on Chinese character stroke learning with app games. This study aims to fill the gap by examining the effect of app games designed to train learners to write Chinese characters, comparing with the traditional pen-and-paper method. In addition, given that the literature has detected inconsistent findings about the influence of character density on character learning, it is necessary to further investigate this topic. The study is designed to address this issue. Our research questions explored were:

1. Which method is more effective for learning character stroke order, app game or workbook?
2. What is the effect of character density on Chinese character stroke learning?

We anticipate that the results will have implications for Chinese character instruction at all levels, and they will also contribute to general hanzi/kanji/hanjia writing instruction more broadly.

METHOD

Participants

A total of 144 students, who enrolled in the first- and second-year Chinese courses in the Chinese program of an American university, participated in the study. The second-year students learned character writing with the workbook method since their first-year Chinese learning, while the first-year students started to learn character writing with the app games since the study was

conducted. Convenient sampling method was used to group the students. Group 1 consisted of forty-eight second-year students, which was the control group, and Group 2 consisted of nighty-six first-year students, which was the experimental group.

Design and Materials

This is an experimental study that had a between-group design and employed a quantitative research method. The advantage of such an approach is that the large sample analysis provides a logical measure from a statistical point of view (Goertzen, 2017).

Sixty characters were purposefully selected from the two textbooks that the first-year participants were using over the two semesters when the study was conducted: *Integrated Chinese Level 1 Part 1 & Part 2* (Liu et al., 2008). Second-year participants had learned both textbooks in their first-year study. To balance the selection of characters throughout the two books with a total of twenty chapters, three characters were chosen from each chapter, with character density ranging from three strokes to thirteen strokes (see appendix 12.1).

The app games, developed and customized for our curriculum by Clavis Sinica (https://www.clavisinica.com/mobile-xiezi.html), are specifically designed for Chinese character writing. The app used in Semester 1 had eleven lessons, the first of which was Introduction, but we did not use this lesson in this study because it only included radicals instead of characters. The app in Semester 2 had ten lessons. Each lesson had two sections (A and B), as shown in the app main page (see figure 12.1).

For each section, there were three learning modes: train, drill, and test. In the training mode, learners could view the stroke animation of each character and practice with the guidance of the given character outline. Any errors made would be automatically checked by the app, which would prompt the learner to try again. Learners also had the option of viewing the next stroke, all the strokes left, or a hint of the next stroke. The English meaning and pinyin were shown on the top all the time. The pronunciation of the character was played every time when the character was chosen (see figures 12.2 and 12.3). As learners progressed, they could continue to the drill mode, which allowed them to practice writing the characters from memory. If an error was made, the app would demonstrate the correct version immediately and, in the meantime, send the character back to the character list for later trying again. In the test mode, learners had only one chance to write each character from memory and the score would be recorded for accuracy and progress checking. Some additional nice features of the app included: 1) All the characters that learners wrote wrong were put into one folder, "Missed Characters," for later practice; and 2) Users could set the drawing speed and choose to show grid, character outlines, and/or definitions (see figure 12.4).

The control group learned the same set of Chinese characters in their first-year study using the traditional repeated handwriting method on worksheets shown below, in which they practiced writing each character over and over again until they remembered it (including the stroke order) by heart (see figure 12.5).

Data Collection and Analysis

The data were collected in the two semesters of the academic year of 2015-2016. Since the study was part of classroom practice, the stroke order knowledge assessment for the study was included as one of the question items in the written test, which was given to the students after they finished learning every two chapters. Both participant groups were tested on all the selected characters. A question item example is shown below, which asked the participants to write out the stroke orders of the characters given.

Please write out the stroke order of each character:

e.g. 月: 

Throughout the two semesters, the participants were asked to recall and write out stroke orders of a total of sixty characters over ten tests, all of which were designed, administered, collected, and graded by one instructor who was teaching the two groups of participants. Each student's performance of each character stroke order recall was coded according to four categories: accurate, 1-stroke error, 2-stroke error, and >2-stroke error. After the instructor graded each test, she entered the accuracy counts into a spreadsheet including character identity, semester number, total number of strokes for each character, number of students who accurately recalled the stroke orders, who made 1-stroke error, 2-stroke error, or more than two stroke errors, as well as the calculated percentages for each accuracy category. Then the overall accuracy rates for each semester and the whole year were calculated. Character density was examined according to two measures, one as a continuous variable and the other as a dichotomous variable.

Independent samples t-test was used to compare the overall accuracy rates of the two groups and correlation tests were used to explore the relationship between character density and learners' stroke order learning.

RESULTS

The overall accuracy rate results (see figure 12.6) showed that Group 1 scored 87.76 percent and Group 2 had 53.53 percent. An independent samples t-test

was conducted to compare the overall accuracy rates of the two groups. Group 1 (M=87.76%, SD=12.41%) significantly outperformed Group 2 (M=53.51%, SD=23.5%), t(112)=9.865, $p<.001$. In addition, 1-stroke, 2-stroke, and over-2-stroke mistakes were calculated for both groups. Most of the mistakes for both groups occurred in 1-stroke category (Group 1: 8.13%; Group 2: 24.07%), followed by over-2-stroke mistakes (Group 1: 2.62%; Group 2: 13.5%) and 2-stroke mistakes (Group 1: 1.49%; Group 2: 8.91%).

Second, when comparing the participants' performance between the two semesters (see figures 12.7 and 12.8), Group 1 was found to show some improvement from Semester 1 (85.44 percent) to Semester 2 (90.07 percent), whereas Group 2 remained the same in two semesters (53.67 percent vs. 53.38 percent). Group 1 showed decrease of mistakes in all three categories (1-stroke, 2-stroke, and >2-stroke), while Group 2 showed less 1-stroke mistakes but more 2-stroke and >2-stroke mistakes.

Finally, to examine the effect of character density on learners' accuracy of stroke order recall, two correlation analyses were run for the two groups with character density as a continuum. Neither analyses reached significance level. The plot graphs (see figures 12.9 and 12.10) show that there is no clear pattern between character density and students' stroke order accuracy.

We further explored the effect of character density by characterizing it as a dichotomous variable (low: ≤ 7 strokes; high: > 7 strokes) following Sergent and Everson (1992). Group 1 showed some accuracy rate improvement in Semester 1 (81.56% → 88.41%) and remained almost the same in Semester 2 (90.24% → 89.93%) as character density went up from low to high, whereas Group 2 demonstrated almost 10 percent improvement in Semester 1 (47.99% → 57.08%) but an accuracy rate drop in Semester 2 (59.27% → 48.22%) as character density increased from low to high (see figure 12.11).

An interesting anecdote is that when we further looked at the characters with the fewest and the most strokes, the learner performance was clearly not affected by the stroke density. The accuracy rates of both groups for "签," one of the characters that had the most strokes, were much higher than those for "刁" and "马," the two characters with the fewest strokes.

DISCUSSION AND CONCLUSION

The results of the study showed that it is more effective to use character writing app games to learn Chinese character stroke order than the traditional workbook method. Students make significantly fewer errors on stroke order recall if they learn and practice Chinese character writing with app games. These findings are consistent with the positive effects of computer-assisted tools that previous studies have found on students' Chinese character learning

(Tang & Leung, 2006; Tang, Li, & Leung, 2006; Tsai, 2014; Tsai et al., 2012). Unlike the traditional character worksheets that require students do the tedious, repetitive tracing and copying, the animated demonstration of the precise stroke orders on apps helps students easily understand the complexity of the Chinese writing system as well as each individual character. Moreover, forcing students to follow the stroke sequence allows them to practice the correct stroke orders in a game-like manner. Although we did not collect qualitative data, informal conversations with the participants also revealed that most of the students thought the app games were engaging, fun, and effective.

In addition, there are two interesting instructor observations: 1) overall, the students who used the app games were able to produce characters faster than those who used the pen-and-paper method; and 2) they tended to follow the stroke rules more strictly and arrange the character structures and stroke positions in a more balanced way, whereas the character structures produced by the students who learned character writing with worksheets looked more scattered and less compact and standard.

The study also found that character density does not have any effect on character stroke order recall no matter which learning method the students used, app games or the workbook method. This finding is inconsistent with most of the previous studies that have found significant effect of character density on Chinese character recognition, recognition speed and accuracy, and written recall, except for several studies (Hayes, 1987; Ke, 1996; McEwen, 2006) that have detected discrepant influence of density on character recognition versus production. We speculate that the reason for the difference is the different research focus and task design. Previous studies examined character recognition and production accuracy and/or speed (Chin, 1973; Ke, 1996; McEwen, 2006; Sergent & Everson, 1992; Xiao, 2002), while ours investigated learners' knowledge of character stroke order. Being able to recognize and produce a character correctly is different from being able to write out the correct stroke order of a character. The latter is a much more detail-oriented writing skill, which requires learners to be able to understand stroke rules and analyze character structures, and apply them in various character situations to arrange different components to form radicals and characters. When doing this, they tend to focus more on following the stroke rules and character structures than anything else. This might explain why our study did not find the significant effect of character density on character writing.

Pedagogically, this study contributes to the Chinese writing instruction by introducing and applying new methods to investigate students' writing and experimenting with novel technology tools to analyze their writing performance. The findings reveal that the app game is an effective tool to help learners master stroke order, which can help instructors to free up some class time for other activities and content. What's more, with the help of app

games, character writing practice and learning are no longer constrained to time and location. Learners are able to do it wherever and whenever convenient for them. As mentioned above, most students informally commented positively about the app. However, a small number of students who used the app device to learn character writing mentioned to the instructor that they missed handwriting characters on paper and they felt it is better to learn to write on paper. To cater to learners' different learning styles, instructors might need to make some adjustments to the instructional requirements. For example, making handwriting characters on a worksheet an option for the students who would like to use both methods.

Limitations and Future Research

This study has shown that the character writing app significantly improves learners' mastery of stroke order. Considering that the app also shows the pronunciation of each character as well as its meaning and word combinations, it would be interesting for future studies to investigate its effect on learners' Chinese listening, speaking, and reading performance. In addition, although the study showed that character density does not influence stroke order recall, future research can be devoted to examining what factors might influence stroke order learning and how.

This study has several limitations. First, it employed a convenient sampling method for easy availability of data collection. As a result, the research findings got the views of the local specific sample, but whether they are applicable to other populations at large needs further exploration. In addition, to make the study more generalizable and accurate, future studies may consider recruiting more participants from a large range of resources such as Chinese L2 learners from different universities at different levels. Second, this study merely looked at the quantitative data. Although the research findings were objective, more fine-tuned information in terms of the participants' Chinese character writing experiences and their perspectives regarding how they memorize the stroke orders, what the challenges are, and how they tackle them will be helpful to further understand the learning process. To triangulate the data, future research can include qualitative data by conducting some individual interviews or writing sessions.

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APPENDIX 12.1

Characters in the App

Semester 1	习	发	名	老	因	回	饭	进	希	周
	空	知	孩	贵	思	亮	面	说	音	请
	家	难	喜	睡	果	员	种	飞	每	快
Semester 2	马	天	心	本	外	包	肉	同	当	园
	忘	间	连	迎	雨	往	房	具	抱	险
	烧	爱	班	病	息	哭	就	道	简	签

Author Created.

Chapter 13

DaZiBao

Multimodality in Learning and Communicating via Chinese Characters

Justin Olmanson, Xianquan Liu, Christopher C. Heselton, and Asha Srivastava

INTRODUCTION

Learning to read and write Chinese is hard (Shen, 2005). It is especially difficult for learners who are only literate in Indo-European languages like English. Different from English in phonology, morphology, orthography, and phraseology, Chinese character learning has been identified as one of the most challenging facets of learning Chinese, especially for speakers unfamiliar with logosyllabic or character-based writing systems (Moser, 1991; Olmanson & Liu, 2017; Shei & Hsieh, 2012).

Since the 1950s, most novice learners of Chinese are introduced to a phonetic, alphabet-based system of written Chinese called pinyin. Pinyin has been found to lower cognitive load and promote self-efficacy at the beginning stages of Chinese language learning (Chung, 2003; Lee & Kalyuga, 2011). It is used by native and non-native speakers of Chinese as a way to begin the process of developing literacy. Learners initially use pinyin to read and write. Often the Chinese characters are positioned above the pinyin pronunciation as a way to familiarize students with the writing system before requiring them to use it. They are then gradually introduced to practices for learning, reading, and writing Chinese characters. Eventually, students are weaned off of the use of pinyin. While pinyin serves as a bridge to Chinese writing, transitioning to only using characters can lead to student resistance. Students often report feeling restricted in their ability to communicate in written form—as they typically know the pronunciation/pinyin for many more words than they know the overall shape and stroke order for the characters. Learning

characters and making the transition from pinyin is often accomplished via a great deal of repetitive, memorization-focused study (Huang, 2014).

In this chapter we briefly describe the challenges non-native Chinese speakers face in becoming literate in Chinese. Next, we make design connections between digital character input methods and language learning pedagogy. We then describe the instantiation of these connections in the design of a Chinese writing and literacy learning application. We unpack the findings of our initial study of the impact the web application had on learners' experience of communicating via Chinese writing. Finally, we describe the implications these findings may have for Chinese language instruction as well as implications for application redesign.

LITERATURE REVIEW

Challenges for Non-Native Speakers

The challenges non-native Chinese speaking learners face when becoming literate in Chinese are multifaceted. For a literate English speaker, learning to communicate via written Chinese requires extra time and effort over and above that which is required for learning to write in Spanish or Vietnamese. English speaking students are not able to apply much of what they know about writing in their first language to writing with characters. While some characters give clues to meaning and pronunciation, these clues (semantic and phonemic radicals) hold true for less than half of Chinese words. Due to the uniqueness and complexity of the writing system (see Olmanson & Liu, 2017), acquiring literacy in Chinese is a process that differs significantly from becoming literate in an alphabetic orthography (McBride, 2016). Literacy is typically accomplished via repetitive copying and stroke order practice, flashcards, rote memorization, and a study of semantic radicals and character evolution (Zhao & Jiang, 2002; Huang, 2014). In other words, learning to read and write in Chinese involves making a choice between spending extra time and effort learning characters (Yu, 2015) or sacrificing time that would otherwise be spent expanding one's Chinese listening and speaking skills. When confronted with such a choice, it is no surprise that many students opt to expand their aural comprehension and just use Google Translate, other apps, or pinyin for writing tasks.

Chinese Literacy Learning Approaches

One of the most vigorously discussed topics about CSL/CFL literacy learning is related to the timing and practice of teaching Chinese characters to non-native learners. Both Dai (2017) and Zhao (2011) describe the three

popular approaches concerning when and how to teach Chinese characters: a) delayed instruction; b) parallel instruction; and c) integrated instruction. In delayed instruction, reading and writing via characters is postponed or put off in favor of more intense instruction in speaking and listening (Packard, 1990; Shen, 2014). Instructors explicitly introduce and teach Chinese characters only after students have been exposed to them over the course of speaking and listening instruction. This approach is believed to lower cognitive loads and align well with contemporary approaches to second language acquisition. While the longer teachers wait the better prepared students will be to learn characters, waiting longer also means that the gap between speaking/listening and reading/writing levels is that much greater. This approach exacerbates the gap potentially leading to stress, frustration, and attrition (Dai, 2017; Ye & Ye, 2012).

In parallel instruction, Chinese characters are introduced and taught from the very beginning but in a detached manner (Zhao, 2011). In other words, learning how to recognize and write Chinese characters is not integrated into the curriculum. Instead, simple characters are introduced before more challenging characters regardless of how and when they appear in the dialogues and phrases students are learning to understand and say. The advantage of this approach is that students waste no time before learning characters. However, literacy learning via this approach usually is little more than rote memorization and decontextualized drill focused on isolated characters. Due to its repetitive, non-communicative nature, student interest and motivation in learning characters via parallel instruction is often undermined (Chen, Ye, & Wu, 2015; Dai, 2017).

An integrated approach to character instruction means that students learn listening, speaking, reading, and writing at the same time and within a shared context (Dai, 2017; Zhao, 2011). Chinese character instruction is thus not delayed or set apart but embedded in the curriculum. Chinese characters are interlaced with all the other aspects of Chinese language learning—familiarizing students with word sound, meaning, shape, and stroke order at the same time and in context. The goal of this approach is to make Chinese character learning as relevant, meaningful, and contextualized as possible. The challenge in using this approach is that integrating reading and writing with characters into the curriculum significantly reduces the pace of learning (Tse, Marton, & Loh, 2007; Knell & West, 2017; Zhao, 2011).

To date, whichever the approach, listening and speaking communication levels tend to significantly exceed reading and writing levels. Additionally, transitioning from pinyin to characters or learning characters from the outset requires strategic, scaffolded pedagogical supports. These challenges and realities drove the early stages of the development of our intervention for Chinese literacy acquisition.

The literature on Chinese literacy development is generally focused on effective approaches to Chinese character learning. Zhao and Jiang (2001 & 2002) reported six commonly used strategies among non-native learners of Chinese, namely rote memorization, pronunciation and meaning connection, stroke order, review, application (use characters in tasks/context), and summarization and synthesis. Elements of these and other learning strategies are often embedded in Character learning technologies. Pinyin and typing, explicit instruction of character components (internal structures), stroke order, approaches to handwriting, and cultural elements appear to different extents in Chinese learning apps (Liu & Olmanson, 2016; Olmanson & Liu, 2017).

Among the character learning strategies, the use of typed pinyin below written characters is commonly used and resonates with the *pronunciation and meaning connection* learning strategy used by non-native learners of Chinese. Neubauer (2017) advocates establishing strong Chinese sound-meaning connections via focused, contextualized, comprehensible input to cultivate auditory understanding. Once learners show evidence of aural understanding, more diverse, longer texts are used in facilitating character recognition through whole language activities. This aligns with research findings (Yao 2015) that suggest non-native readers of Chinese are more sensitive to context clues than native speakers.

To sum up this subsection, pinyin is generally accepted as an effective tool to support Chinese character learning. While the debate concerning when and how Chinese characters should be introduced continues, students' reading and writing levels have always lagged behind speaking and listening. Recent research calls for contextualized, integrated character learning—especially via strategies that establish sound-meaning-character connections. Additionally, given the way pinyin is used by hundreds of millions of people every day as a digital input method to communicate via Chinese characters, CSL/CFL learners are taught pinyin regardless of which character introduction approach is used.

Digital Character Input Methods

Though not used in print outside of learning contexts, pinyin, the Chinese phonetic system, is the most commonly used digital character input method for Chinese writing. The process is reasonably straightforward: first, pinyin, without a tone designation, is entered into an input box. Next, a row or table of all characters that have the same spelling appear in order of frequency. The user then scans the row(s) looking for the intended character and selects it—causing it to appear in the composition.

Using a pinyin-based character input method to write in Chinese supports character learning in that it helps students make sound-meaning-character

connections (Chang et al., 2014). When students type the untoned pinyin with a character they have learned in mind, they have to discriminate the differences between characters or combinations of characters to choose the one that they want. Using pinyin in this way enables writers to express themselves in text even when they are not able to produce characters by hand—allowing them to focus on context and meaning.

While the use of a character input method allows learners to avoid memorizing stroke order via handwriting, this approach is only useful for characters students can already identify. Thus, it does not address the gap between larger speaking-listening vocabularies and smaller Chinese reading-writing vocabularies. In the next section, we describe a tool developed by members of our research and design team (Hellwege, Olmanson, & Liu, 2017) to address this gap via a modified, multimodally scaffolded version of a character input method in support of Chinese literacy development and written expression.

DESCRIPTION OF THE TOOL

DaZiBao [http://chinesecharacterhelper.com] (Hellwege, Olmanson, & Liu, 2017) is a Chinese writing application that uses students' Chinese speaking skills and their ability to spell the words they know via pinyin to enable communication via Chinese characters. DaZiBao was designed to assist learners in establishing connections between pronunciation-based pinyin and character-based writing by extending traditional Chinese character input method technologies with the capacity to provide multimodal scaffolding.

When students type the pinyin of the word or words they want to write in Chinese, a list of up to seven of the most frequently used characters sharing that spelling appear immediately—mimicking Chinese input technologies used by native speakers (see figure 13.1). If no selection has been made for three seconds, spoken pronunciations of each character are made available via audio icons under each character (see figure 13.2).

If, after an additional four seconds, the user has not selected a character, a column of images appears under each of the seven character options (see figure 13.3). Following the image display, if no selection has been made after another five seconds, English translations are made available via dictionary icons (see figure 13.4).

Students can click or tap on the character they want to add to their composition at any time and it will be inserted at the end of their Chinese text (see figure 13.5). Compound words and phrases can be entered as well—with the same time-delayed multimodal supports.

METHODS

In this study, we inquire into the pedagogical potential of a technology-supported Chinese character learning and literacy acquisition application. The design of our tool draws on the literature regarding Chinese character learning. Through this design and study, we seek to better understand how a scaffolded digital writing tool might influence how students learn and express themselves via Chinese characters.

Participant Identification and Recruitment

We contacted Chinese teachers in the Midwest via email, requesting their consideration to participate in an IRB-approved study of technology-supported character learning and Chinese literacy. In the email, we explained that the intervention offered a series of timed pronunciation, visual, and translation supports. Additionally, we explained that the intervention was designed to support participants in acquiring written Chinese via each student's listening and speaking vocabulary in Chinese as well as their understanding of pinyin spelling conventions.

Participants, Research Setting, and Data Sources

Student participation, instructor interest, and researcher resources enabled members of our research group to collaborate with two instructors and learn from fourteen participating adult-age students (between nineteen and fifty-five years old) during the final two weeks of the Spring 2018 semester in two Confucius Institute courses—both in the same town. Both of the courses were entry-level Chinese with most participants beginning their study in September of 2017. During the course, students met for two hours each week. Both participating teachers employed a delayed approach to teaching Chinese characters—attributing their decision to student resistance to learning characters and limited contact hours with their students.

We conducted a qualitative study deploying ethnographic methods. In order to understand the impact the web application had on Chinese literacy development practices, we observed participants using DaZiBao in classrooms, we collected server log data, screencasts of student use, student artifacts, and conducted individual student and instructor semi-structured interviews except in the case of two participants [Lily and Luke] who asked to be interviewed together.

Data Analysis Procedures

Our analysis is based on grounded theory. We applied this analytical approach to the semi-structured interviews we conducted with our two participating

teachers and fourteen students, the screencast videos, observations, and server log data (Strauss & Corbin, 1998; Weiss, 1994; Wolcott, 2005). As mentioned above, collection of this data happened during spring 2018 in two Southwestern Midwest Confucius Institute classrooms. We observed and collected data from study-related activities over a two-week period. Specifically, we took fieldnotes from participant observations (Spradley, 1980) in the two classrooms, as well as individual interviews and tool use sessions with students and teacher interviews. We employed artifact analysis (LeCompte & Preissle, 1993; Halverson & Magnifico, 2013; Olmanson et al., 2016; Van Gog, 2007) and an iterative analytical approach (Anfara, Brown, & Mangione, 2002) wherein members of our research team generated base codes and affixed them to text in the interview transcripts, and fieldnotes, as well as to parts of the screencast videos. In terms of base codes, we created 321 unique base codes and assigned them wherever they applied. Next, we mapped these codes by topic and theme—noting their frequency. Additionally, we wrote reflective memos and had conversations as a group about what we were observing in the field, what we saw in the screencasts, and what we read in the interview transcripts.

DATA ANALYSIS AND FINDINGS

We organize our findings into three categories. The first section is based upon student and teacher interview data. Participants describe their experiences learning and teaching Chinese in general and characters in specific. Section two consists of screencast video data of students using DaZiBao in the completion of an open-ended writing task and interview data of participant talk about their experiences using the tool. The third section focuses on insights regarding usability issues students encountered and subsequent suggested changes to the intervention and the application's (re)design based on observed tool use and participant interviews.

Learning and Teaching Chinese Characters

Our fourteen participants echoed the findings of other researchers in terms of the nature of learning Chinese writing. When asked about their initial perceptions and experiences related to learning characters, Luke laughed, saying, "It's so hard . . . it seems to be something that even now [after more than a year learning Chinese] I couldn't even make sense of [the characters]. They just . . . look very difficult." They found few opportunities for leveraging their English and Spanish literacy and language skills to support Chinese literacy acquisition.

Additionally, participants saw developing Chinese literacy not as a process of reading and writing but rather as practices of committing individual word meaning, stroke order, pronunciation, and character shape to memory. Lily and Aaron both described the gap between their first and second languages and how that influenced their approach to character learning. Lily said, "it's not like English where you can see the letter and get a hint about the sound of the words . . . they should look like what they are. If it is a character for 'book' it should look like a book. [But it's not, so] I can only memorize." Aaron said, "that's the most intimidating part, because it's so different. There's no alphabet. It's a lot of memorization, a lot of work." Participants tended to attempt to learn Characters via memorization, often via repetitive handwriting and flashcard use—all while not enjoying the experience. "I'm kind of a visual person, I just look at [a character] and I copy [it and then] copy without looking at it," said Ashley. Becky also identified the process of writing each character out by hand multiple times as the best approach for her, "even though it is really obnoxious," she said.

Students focused more on individual character structure, meaning, and script instead of using them in authentic contexts. Accordingly, students have limited ways to learn Chinese characters, mostly by repetition and rote memorization. In addition to repetitive handwriting, the use of imagery was a common character learning strategy. "I just try to visualize it, try to match it with the work," said Evelyn, "which works sometimes, and sometimes it doesn't work." Laura combined character writing with images, saying, "I've made flashcards, and I've written [out the characters]. If I don't do that, I don't learn."

Other than the strategies mentioned above, three students said they used apps in support of their Chinese character learning—primarily for looking up word meaning and writing practice. Overall, the strategies used by participants were comparatively fewer and less diverse than those found in other studies (Li, Yao, & Liu, 2011; Zhao & Jiang, 2002). A possible reason may be that the two teachers did not allocate much time to teaching characters or supporting students in trying out different literacy development strategies. In their interviews they said there was too much to cover and too little class time to help students adequately learn characters in community education, non-credit granting classes such as theirs.

Tool Use and Perspectives on Tool Use

Findings from observed student use of DaZiBao via screencast recordings suggest that its use enabled more communication-focused less repetition-focused language practices involving characters. Learners experimented with pinyin spelling, phrasing, and spacing. Students frequently used audio and

images in support of making character selections with and without accessing direct English translations.

In interviews with participants following their use of the application, they characterized DaZiBao as helpful, as a way to express themselves in Chinese, as a gateway to writing sentences, and much better than other ways. Steve said, "if I were to write [by] hand, I would probably look up all the characters and [have to do some] recopying. It would take much longer." After using the application for an open-ended writing assignment, Becky also recognized the usefulness of some of the supports, saying, "writing by hand is . . . a lot harder, because you don't have the pinyin to go back on, and you just have to know it. It's more like look it up and write it down. I did like that, I did like [DaZiBao] for that reason. I didn't have to know the character exactly, I can just recognize it."

Participants also mentioned unanticipated ways the experience supported their awareness of language features. Luke stated how using the application's audio feature—allowing users to hear correct pronunciations of each character—supported reflection on pinyin spelling conventions, saying, "I did the same thing with *xihuan*, I had it *xianjuan*, [then I listened to the audio and] I was like 'it was not right.' Then, I was like 'oh, yea, it was *h*,' and I had to go back to switch it in the spelling. I was like, oh, ok, you have to get the spelling right before it gets you the right character." Laura attributed getting stuck during writing to her incomplete understanding of pinyin saying her struggle was "my own fault."

Though some students expressed frustration around having to use pinyin as the basis for their writing without being able to just type in a word in English and get the character equivalent back, many came to recognize it as educational. For example, Lily said, "it would be nice to have the option, once in a while, to look up in English to make sure to get the right word, but it might be too helpful, and people would rely too much on that and that wouldn't be good." As they did their interview together, Luke followed up on Lily's reflection, saying, "I don't think adding another crutch [direct English to character translation] moves you forward, it moves you backward." Both of their statements suggest that they noted the distinction between the fastest way to produce a character and pedagogical ways of supporting Chinese writing and literacy development. Likewise the imposition of wait time before each support was revealed was also seen as both frustrating and useful as it gave students the opportunity to remember and work through it on their own first.

Intervention and Tool (Re)Design

Across the data, via student and teacher interviews, from student behaviors during their use of DaZiBao, and from log data, we identified several design

issues and considered some redesign options for the next iteration of the tool in terms of better learning supports and usability improvements.

As mentioned previously, participants had mixed feelings about being forced to start with pinyin without in-app access to English-to-character translation. They acknowledged the educational value of the character generation process but noted that these design decisions came with constraints. Ashley said, "if I could speak the word, then it could find the pronunciation [via pinyin]," implying that if she did not know the word or the pinyin system well enough she could not use the tool. Laura explicitly pointed out in her interview that the current design constrains students from using words not in their listening/speaking vocabulary, saying, "[if] I didn't know the word in Chinese to start with, I couldn't type anything in to get the character. I didn't have the vocabulary."

Another requested design change among participants was a reordering of the supports offered by the tool. As described in tool description section, the application provides audio, image, and translation supports in that order. Some participants expressed a preference for images to appear before audio supports. Student preferences were also evident from video screencast data.

The two participating teachers, Yue and Ru, expressed an interest in having more guiding information for integrating the application into their teaching practice. Yue saw the application as potentially helpful for both teachers and students but requested more direction in terms of how to effectively introduce and use it in the classroom. Yue said, "teachers . . . have limited ability and resources to learn and to figure out how to use an app or a technology tool in teaching." Adding exemplars and models of in and out of classroom use aligns well with theories of technology integration. Offering successful integration examples (Bandura, 1994) is one of the approaches that can positively impact self-efficacy. In turn, self-efficacy is one of the strongest predictors of effective technology integration into teaching practice (Abbit, 2011; Huffman, Whetten, & Huffman, 2013). Additionally, Ru identified the need to more explicitly train her students in the use of pinyin, saying, "students should learn pinyin very well. Then, they can start to use it [in the application]. [DaZiBao] should be introduced during pinyin instruction, talking about how to use it, how to practice."

DISCUSSION AND IMPLICATIONS

Similar to other studies, our participants tended to view what they were doing not as learning how to communicate or express themselves in another written language, but rather as memorizing characters via repetitive handwriting. They reported that they tended to spend little time working to improve their Chinese reading and writing abilities as they felt memorizing several hundred

characters in isolation was a tedious and daunting a task—one that left them feeling frustrated. Our findings align with findings in other studies on Chinese character learning strategies, namely that the most popular character-learning strategies among non-native students of the Chinese language are orthographic knowledge-based strategies that focus on learning characters as individual units (Jiang & Zhao, 2001; Shen, 2005).

The majority of our participants held negative views of learning Chinese writing—which they equated to memorizing and producing individual characters. This is a centuries-old problem (Fan et al., 1987; Ke et al., 2001). Despite some research studies and technology designs that help learners in focusing more broadly on literacy (Shei & Hsieh, 2012), Chinese character teaching and learning has been slow to unmire itself from decontextualized, isolated practices. This may be due to a combination of high cognitive load and anxiety on the part of the student and adherence to traditional pedagogical approaches to character instruction by teachers (Huang, 2014). Many Chinese language teachers in the United States are native Chinese speakers with degrees in non-language-teaching fields and thus draw on traditional Chinese teaching philosophies and methods that were used when they were learning to read and write (Hustad, 2015).

While not without its issues, participants viewed DaZiBao positively and termed it a helpful tool to facilitate the practice and review of Chinese characters and were interested in using the application in the future. This is in line with findings from other research studies that position technology integration as a source of student motivation to learn Chinese characters (Lu, Meng, & Tam, 2014; Wong et al., 2013). Analyses of screencast and interview data suggest that our intervention provided learners with a tool that made producing Chinese texts and character learning an achievable goal via less repetitive, less character-centric practices.

Multimodality in Support of Literacy Development

While images, audio, and translation have been used in support of learning a second language for centuries (Shrum & Glisan, 2015) and are a central component in contemporary literacies and literacy acquisition (Jewitt, 2005), studies this century suggest that it may not be optimal to provide supports in different modalities simultaneously as it increases learners' cognitive load and detracts from a focus on the target language (Lee & Kalyuga, 2011). Our timed sequencing of multimodal supports (Shrum & Glisan, 2015) both led to participant frustration and was largely interpreted as helpful for learning. The multimodal intervention supported students' open-ended writing activity and engaged participants in writing that might otherwise have been too challenging or impossible. For learners who usually approached writing practice as character practice, the challenge to not only produce characters but also

compose a text made up solely of Chinese characters at the same time was new. The sequenced, time delayed multimodal supports in the application allowed participants to focus on expressing their ideas based on their listening and speaking knowledge of Chinese—instead of limiting themselves to the characters they already knew or looking up each character through its English translation.

Implications

Our analysis of the data has yielded insights into several trajectories for the ongoing design of the intervention and web application. Participants used strategies that they found unpleasant and inefficient but they felt they had no alternative. We are interested in adjusting our design to better support Chinese character and literacy learning. To this end we plan to increase the size of the text output field—allowing users to see all of their writing without having to scroll left to right. We will also experiment with providing options for learners in terms of reordering the sequence in which image supports and audio supports are displayed. Despite participant interest in making the English translation available earlier in the sequence, we do not see this as growth inducing. While testing this may prove empirically useful, given our limited resources, there are other research trajectories that we find more compelling. We also plan to develop a way for learners to be able to write and save their composition within the application instead of having to copy and paste their text into other word processing platforms. This feature would afford report generation and facilitate teacher feedback and learner self-reflection on Chinese literacy development progress.

Finally, both teacher and student participants requested more ideas and detailed guidance to effectively use DaZiBao to support Chinese character learning in the future. This resonates with the work of other researchers and theorists that suggest teachers and students need support and guidance in using technologies that make new practices and learning pathways possible (Cuban, 2003). Increased communication and designed artifacts between our research team, teachers, and students in terms of how best to support their understanding of how the tool can enable expression and learning is a priority we have identified.

CONCLUSION

The inquiry in this chapter suggests that a sequenced multimodal application can serve as a supportive method for learning the unique and challenging Chinese orthographic system. By leveraging each student's understanding of

Chinese phonology and pinyin, participants were able to compose a text with Chinese characters. Further and ongoing inquiry holds the potential for us to better understand the challenges students face in learning Chinese characters and the potential a multimodal system for Chinese writing has for changing the way students develop literacy in Chinese over the course of an entire semester. This work may serve as a way forward for language researchers and designers in helping students overcome the challenges of learning one of the most difficult writing systems in the world via a communicative platform with multimodal supports.

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Chapter 14

Acquiring Chinese Character Literacy Through Student-Produced Videos*

Sujane Wu and Yalin Chen

It is well acknowledged that Chinese is one of the most difficult foreign languages for learners of other native writing systems, such as the Roman alphabetic system. The Foreign Service Institute (FSI) of the Department of State has also identified Mandarin Chinese as one of the five languages that are exceptionally difficult for native English speakers to learn.[1] Why is this so? From the learner's point of view, the primary factor is the writing system (Ke, Wen, & Kotenbeutel, 2001). Chinese characters can look very similar and there is no alphabet component from which they can draw clear pronunciation cues when reading and writing. Furthermore, the Chinese writing system is characterized by its complex configuration and the lack of "obvious sound-script correspondence" (Shen, 2004, p. 168). For example, characters like 我 (wǒ), 找 (zhǎo), and 俄 (é) look similar and are confusing to beginners. Thus, to learn how to both read and write each and every character is a daunting task for beginners (Everson, 1998; Fan, Tong, & Song, 1987; Hsu, 2012). Since Chinese characters are the most essential and pivotal component of learning Chinese as a foreign language (CFL), how can we help our students at the beginner level achieve character literacy and overcome the challenges and anxiety of learning Chinese characters? This question is critical for both learners and instructors, and deserves our attention because many beginners are frustrated by the time and energy they spend on learning characters in both *remembering and reproducing* (Ke, Wen, & Kotenbeutel, 2001; Shen, 2004). They often gradually lose interest due to the difficulty of

*This is an ongoing project and the website is constantly updated: https://sophia.smith.edu/chinese-character-literacy/. We would like to express appreciation for all the student participants in the beginner Chinese courses since fall 2014. We are also grateful for all the colleagues and student assistants who have helped us along the way. Special thanks go to Yasmin Chin Eisenhauer, Joseph Bacal, Mario Valdebenito Rodas, and Chang Liu.

the task, especially since there are more than 300 characters that a beginner usually needs to recognize and learn how to write during their first semester of studying Chinese as a foreign language.

Research has shown that once students overcome the most formidable aspect (i.e., Chinese characters) of Chinese language at the beginner level, they are most likely to go on to the intermediate level and be successful (Chiang, 2002; Hsu, 2012; Lafer, 1986; Shen, 2005; Zhang, 2001). Therefore, the introduction of characters to beginners with a systematic strategy is crucial and has a long-term impact. Character knowledge and familiarity also strongly influence students' comprehension of text and the other three aspects of Chinese language such as writing, speaking, and listening (Shen, 2005, also quoted in Ross, 2016). Helen Shen has studied the effect of character knowledge on text comprehension and concluded that "readers' word knowledge is a strong predictor for beginning level reading; an increase of one percent of unknown words in the reading text could bring about a decrease of reading comprehension rate from 2 to 4 percent." (Shen, 2005, also quoted in Ross, 2016). In learning Chinese, word knowledge heavily depends on character literacy, so the optimum approach and attitude learners should take to achieve their character literacy in the beginning level becomes an important factor for their later success (Everson, 1986, 1988).

However, the traditional approach of character teaching emphasizes *only* mechanical repetition, and instructors usually do not have the time to give detailed and systematic instructions in class when it comes to character writing and learning. As a result, students are often expected to study on their own outside of class time without immediate feedback from the instructor. This is why writing performance and character literacy among students varies greatly from person to person. For learners who are struggling with character writing, it often also impacts all aspects of Chinese language performance including reading, speaking, and listening (Shen, 2000). This also creates a great challenge for instructors when developing an integrated course.

Thus, in this chapter, we intend to showcase the Chinese Character Literacy (CCL) project we have developed for the beginner level Chinese courses since fall 2014. The CCL project adopts blended learning and a multimodal approach (i.e., with textual, aural, linguistic, spatial, and visual elements) to help students personalize their learning. We also recognize students' different backgrounds and learning styles (Nation, 1990; Hsu, 2012); therefore, the CCL project enables every learner to choose how they learn and take control of their own learning process. The CCL project was designed with the following objectives:

(1) To help students overcome the challenges of character learning in and out of class and cultivate their long-term character literacy.

(2) To enable students to build a solid foundation of character literacy and apply this knowledge to strengthen their understanding of the Chinese language.
(3) To foster students' creativity and agency for their own learning.
(4) To create a collaborative learning environment and enhance students' critical thinking through the peer review process.

BLENDED LEARNING, MULTIMODAL APPROACH, AND CCL PROJECT

Memorizing (input) and reproducing (output) Chinese characters challenge student's confidence while learning Chinese language as a foreign language. As mentioned above, the major reason behind the design of the CCL project is to help students overcome the challenges of character learning and be effective and to give agency to learners in the hope that they will develop their own long-term learning strategy.

Many studies have shown that systematically introducing character knowledge at the beginner level can enhance students' character literacy and greatly facilitate their character learning (Shen, 2004, 2005). Then, *what* do we teach our students *when* it comes to introducing Chinese characters? There are four basic elements embedded in a character that students need to know in order to effectively internalize their learning of the character in terms of its form and meaning: parts/components 部件, radicals 部首, configurations 結構, and stroke order 筆順.[2] As Helen Shen points out, "Character learning strategies among non-native learners should include 'visual and graphic cues' and 'knowledge of radicals'" (Shen 2010, p. 46). A character is composed of parts. The parts are arranged in a small number of configurations. A character consists of strokes and must be written in a certain order (Ross, 2016). Therefore, stroke order instruction and practice, as well as explicit instruction of the phonetic components, are all influential for character retention (Shen, 2004; Knell & West, 2015; Ross, 2016). Overall, a guided and explicit explanation of the aforementioned four elements of any characters has proved to be effective in the process of character learning (Shen, 2004). The CCL project features guided instruction in all four of these elements. The key instruction methods we have used are blended learning and a multimodal approach.

Blended learning is a bottom-up, student-centered pedagogy that is different from the traditional teaching method of top-down approach. The definition of blended learning varies, but in general, it includes any combination of digital learning and face-to-face instruction. In this learning method, students have the first exposure to content or demonstrate their learned knowledge through technology outside of the classroom, allowing more class time for peers and instructor-student interactive activities (such as critiques, application, and feedback) as well as problem-solving skills and reflection.[3]

Having the concept of blended learning in mind, the CCL project utilizes a combination of in- and out-of-class as well as digital and face-to-face learning, which will be demonstrated in great detail below. The CCL project invites students to produce their own character videos (with verbal and nonverbal elements) outside of class after they have acquired foundational knowledge of how Chinese characters are structured. After the submission of their videos, they receive quick feedback online from peers and instructors, and class time is used for follow up and review of common mistakes and reiteration of the correct structure of the character.

Student-produced videos in the CCL project also incorporate a multimodal approach. "The multimodal approach takes into account how linguistic and visual (and other) choices fulfill the purposes of the text, the audience and context, and how those choices work together in the organization and development of information and ideas" (Lim & Tan, 2017). To integrate the multimodal approach to the student-produced videos in the CCL project, we aim to encourage students to explore the multiple semiotic resources (linguistic, visual, gestural, spatial, and audio) of a Chinese character through video production, and our guided instruction fosters students' understanding that a single character embodies various elements, such as graphic cues and phonetic components, that are used interactively for meaning-making (Kress, 2000; Kumagai et al., 2016; Shen, 2004).

How is the student-produced video project (i.e., the CCL project) impacting learners' character literacy? Why do we choose to have students make their own character videos instead of providing them with the many existing digital videos made by professionals? For the former question, two of the most apparent benefits for both students and instructors are: 1) students' entire character handwriting process is captured step by step through video, so their mistakes (if any) are visible to the creator and viewer; and 2) because of the visibility, student-produced video provides an opportunity for self-reflection. Incorporating handwriting practice into their own learning also helps to recognize and reproduce characters (Guan et al., 2011). For the latter question, it causes learners to take an active role in their own learning process (i.e., learner-centered style), instead of passively following the instructions provided by existing online videos (teacher-centered style). Furthermore, by using "meaningful interpretation" with the *storytelling* method, learners can also enhance their memory of character writing (Shen, 2004; Xu and Padilla, 2013). From the survey we conducted (discussed below) each semester, through self-made videos, students have shown strong evidence of the internalization of the knowledge of Chinese characters and have documented their learning process.

ANALYSIS OF STUDENT-PRODUCED VIDEO PROJECT (CCL PROJECT)

Description of the Course and the Project

The CCL project is conducted in the first-year Chinese language classroom in a private college. The class meets five days a week, fifty minutes a day, for thirteen weeks each semester. The course curriculum is organized around a popular beginner Chinese textbook, *Integrated Chinese Level 1*. Since fall 2014, the CCL project has been incorporated into the curriculum to help students acquire Chinese character literacy in a personalized and meaningful way. The project starts around the third week of the first semester after the introduction of the Chinese writing system and continues until the end of the second semester. In the past four years, about 120 students have participated in the project. The majority has been native English speakers, but participants have also included students from India, Japan, Korea, Vietnam, Germany, France, Mongolia, and Nepal, among others.

Procedure and Instructional Steps

A step-by-step CCL project procedure is illustrated in figure 14.1, with face-to-face (FTF) instruction or digital learning (DL) indicated.[4]

The procedure is similar for the first and second semester with the following minor adjustments.

1. In the second semester, the character introduction session and video-making workshop are replaced by one review session to strengthen students' Chinese character literacy and reinforce the project workflow.
2. In the first semester, students choose one character from the assigned lesson to make a tutorial. In the second semester, students are provided a list with three types of topics: similar character comparison (e.g., 我 and 找), word analysis (e.g., 飞机/飛機), and similar word comparison (e.g., 电视/電視, 电话/電話. and 电影/電影). (See appendixes 14.1 and 14.2.)

Video Analysis

In this section, we will introduce the required elements of the video, examine students' progress by comparing the early and later videos, and discuss different learning strategies among individuals. We will also talk about how student-produced videos encourage learner agency and bring out each learner's best ability.

Elements of the Video

To make the character videos, students are asked to include basic Chinese character knowledge such as definition, radical, structure, and stroke orders, along with individual learning strategies. Table 14.1 shows the examples from Ellen's video of 学 (to learn).[5]

Learning Progress

In the following, we will discuss how the student-produced videos provide an important assessment measure for understanding students' learning progress. It is especially helpful when identifying misconceptions about character composition, stroke errors, and inaccurate pronunciations. It is also a great way for students to examine their own progress. First, let's take a look at Lia's understanding of character composition by examining her scripts. In her Lesson 1 video script, she made a common mistake and described the character 问 (to ask) as having two radicals: "The character [问] has the radical mén [门] which means gate, door, entrance, or opening and the *radical kǒu* [口] which means mouth; open end; entrance, gate."[6] After receiving feedback, Lia correctly described 问 in her Lesson 13 video as having one radical 门 (gate) and one pictograph component 口 (mouth) that suggests the meaning of the character. At the beginning of the year, Lia also didn't understand that a character component can be a phonetic indicator, which traditionally indicates the approximate pronunciation of the character. In her Lesson 2 script she wrote, "This character [姐] has the radical 女, in mandarin nǚ, which means woman in English. . . . What does the second part of the character 且 mean?" After revisiting the concept, Lia was able to identify the phonetic component in a subsequent video introducing the character 鞋 (xié), as indicated in the following narration: "This character [鞋] has a left-right structure. The left part is the radical 'ge2' [革] which means leather or animal hide. The right part is the character 'gui1' [圭] which provides the sound."

Through student-produced videos, we were also able to pinpoint their pronunciation issues. For example, Lia mispronounced 谢谢 (xiè xie; thanks) as "siè sei" in her early video. After a few reminders, not only was she able to pronounce 谢谢 (xiè xie) precisely, but her overall pronunciation also improved drastically. Another error she has is using two syllables to pronounce one character, such as marking and saying the character 姐 with two syllables "jiě jie." After the error was pointed out, Lia showed consistent accuracy in her later videos (see table 14.2).

Student-produced videos also help us identify stroke order errors. Correct stroke order plays a crucial role in helping learners retain characters in a systematic way. For example, in Cathy's video of 兩, she miswrote the middle vertical stroke as the second stroke. After receiving feedback, Cathy

demonstrated correct stroke orders in similar structures, such as the element 巾 in the character 掃, which can be seen in table 14.3.

Another example of the stroke error is when the stroke is written incorrectly. For instance, in May's video of 没, she miswrote the bottom right upward stroke ㇀ as left downward stroke 丿, and separated the top right 乚 stroke to two individual strokes. After the correction, as we can see in table 14.4, she showed accurate strokes in the character 拐: both the right upward stroke ㇀ and the continuous stroke 𠃌 were written correctly.

Another example of a common error is the misuse of a character in words or phrases. In Alice's Lesson 4 video, she miswrote 门 instead of 们 in the phrase of 你们好 (Hello, everybody). After noticing her own mistake, she made a note below the video and wrote the correct character in later videos (see table 14.5).

One prominent sign of progress we found is that many students increased their use of Chinese significantly with each video. Take Laura's videos for example. There were only thirteen Chinese characters used in her Lesson 1 script, but 212 Chinese characters in her Lesson 16 script. If we take a closer look at her Lesson 1 script, there are mostly single Chinese characters mixed in English sentences when mentioning radicals and the targeted character itself. On the other hand, in the Lesson 16 script there are mostly well-formed Chinese sentences mixed with a few English definitions. The progress can be seen in table 14.6.

From the examples provided, we can conclude that through video screencasting, the thinking and learning process is visualized, verbalized, and documented, which offers instructors an in-depth view of what students know and how they progress, while giving students an effective way to examine their own learning journey.

Learning Strategies

Student-produced videos also offer great insight into individual learning strategies, such as image association, sound association, context association, and meaning association. Note that each learner may apply multiple strategies in one video, and each character can be learned in different ways among individuals, especially in the later videos. The increasing use of multimodal implications shows the development of individual learning styles and the maturity of the students' Chinese character acquisition.

Table 14.7 shows how Laura incorporated a great range of different strategies when comparing the differences in 住 (zhù; to live) and 往 (wǎng; toward). In Laura's video, she first used "context association" by reviewing how they were used in context. Then she adopted "sound association" to talk about how the shared component 主 gives clues to the pronunciation of 住

and 往. Following is the use of "meaning association," in which Laura discussed how the different radicals distinguish the definitions of both characters. Lastly, Laura applied the "image association" to the radicals to illustrate stories based on the shape of each character.

The four examples illustrated from table 14.8 indicate how individuals can employ unique and personalized ways to learn the same characters 疼 (téng; to ache) and 病 (bìng; sickness). In the first example, Cindy showed the audience how she used image association to differentiate these two characters. Meanwhile, Amy identified the phonetic component 冬 (dōng) and 丙 (bǐng) in 疼 and 病 and used their meanings to distinguish these two characters. Another student, Mary, combined the image and meaning associations as well as creating different stories for each character. In the last example, Lily placed the characters in context by making a complete sentence with both characters in addition to using similar sound and meaning associations.

Learner Agency and Tutorial Style

To transform his or her own knowledge into a comprehensible tutorial, a learner needs to decide how to clearly present information and explain effective learning methods to share with others. Therefore, producing tutorial videos encourages the learners to give full play to share their learning process. Some students used their lively imagination and creativity, other students created informative and engaging tutorial videos, while others paid great attention to detail and gave helpful tips and reminders to avoid mistakes. Examples are as follows:

Julia, an introverted student who got nervous when speaking Chinese, often came up with the most creative way to study characters. When comparing the two similar characters 买 (mǎi; to buy) and 卖 (mài; to sell), she gave a very helpful pointer that 买 looks like a customer buying one hat to wear, while 卖 looks like the seller with many hats to sell. See table 14.9.

When introducing a relatively challenging character 照, Ann, a student who was into drawing and storytelling, came up with a vivid image integrated with bright colors and a fun backstory about the circus to learn the character 照, which can also be seen in table 14.9.

Lia, an analytical and cautious learner, often had a very keen sense of what can cause confusion when learning characters. In the video of 家常, she clarifies that the literal meaning of 家常 implies the type of dish that people often have at home, which is different from the concept of "homemade" dishes in American restaurants. (Refer to table 14.9 for the images and narration.)

Kate, a relatively quiet student in class, had a great sense of how to pace and organize tutorial instructions. In her 跳 video, she reminds the audience

of commonly miswritten strokes, and then demonstrates the strokes again at the end of the video to reinforce the character writing. The image and narration are also shown in table 14.9.

In addition to creating their own videos, students were strongly encouraged to give each other constructive feedback to exercise their critical thinking and create a sense of learning community. Through reviewing peers' videos, students hold each other accountable and empower the collaborative environment. Figure 14.2 shows students' feedback identifying the problematic pronunciation, stroke order, and radicals in their peers' videos.

In sum, creating their own tutorial videos offer students the ownership to explore how they want to learn and how they want to share. Through the videos, we not only have a better understanding of what students know, but also how they progress during the first year of Chinese character acquisition.

Benefits of the Character Literacy Project

From our own observation, combined with students' feedback[7] including a survey, a presentation,[8] and discussions,[9] we conclude that this project has the following benefits:

1. It builds a strong foundation of character literacy and cultivates students' long-term character learning by utilizing all the important elements of Chinese characters. As Student 1 pointed out:

   > One of the hardest parts about learning Chinese is character recall and without certain guidance and materials, this task can quickly seem impossible. However, with a useful tool like the Chinese Character Literacy Project, it helped me not only better memorize characters, it also helped me develop an understanding of what goes into each character. Chinese characters are composed of different components and understanding how those different components work together to create meaning is essential to committing characters to long-term memory.

   Students who have continued to take more advanced Chinese courses stated that the CCL project they participated during the first year has continued to have a positive impact on their Chinese learning. When learning new characters, they are able to apply their prior knowledge as well as the strategies that have helped them learn effectively. As Student 2 indicated, "I think in Chinese 210 and 211, I subconsciously used CCL project to learn characters since it allowed us to learn and utilize all the components of the characters. I think in turn, it made it easier to remember stroke order, and sometimes even infer meaning when you see an individual character used in other words."

2. It fosters learner agency and encourages students to develop multimodal learning strategies. Through making the videos, students are fully engaged in the developing of their own personal learning strategies and play an active role in this process. The various learning strategies that the videos display also help their peers understand characters in different ways. The evidence is seen in the following comments:

> I have come to find that a lot of repetition of characters alone is not very useful unless I actively think about the character and visualize it. I find it the most helpful to make up stories to remember the characters by incorporating the meaning, the sound, and the radical of the character is [if] possible. (Student 3)

> The CCL project [was] very helpful because it challenged me to develop more than one strategy for memorizing characters, including making up a story and drawing pictures. Furthermore, the CCL project exposed me to my classmates' strategies. (Student 4)

3. It strengthens students' overall Chinese language skills, such as speaking, reading, and listening, by the process of making multimodal videos and watching peers' videos. This can be seen in the following comments:

> Not only did it help with my characters, but creating the videos w[as] also a great way to practice speaking. Moreover, watching and listening to other students' videos helped with listening comprehension emphasizing the all-encompassing learning that this project brings. (Student 5)

> The project helped me with my listening and speaking, as well as learning to read other people's [C]hinese handwriting. It solidified phrases such as: "how do you say, what does this mean, how do you write," etc. (Student 6)

It also promotes each student's ownership as a learner when reflecting on their own video making, which encourages self-awareness and self-correction. As another student noted, "It helps with speaking and listening because when you edit it, you can hear if the words are off or not" (Student 7).

4. It creates a collaborative and supportive learning environment. As students presenting at Celebrating Collaborations stated, the CCL project creates an inclusive learning community that welcomes diverse learning styles and helps students to connect to each other on a more personal level. This is highlighted in the following comments.

> I think it did [help create a community] because we commented on each other's videos, and applied other's successful strategies to our own videos. It was a safe place to try out new things and the grades weren't important enough to impede our creativity and trying new things. I also enjoyed watching the videos on the same characters that I did, and I usually learned even more when I did that. (Student 8)

> It connects me with other students so that we can practice together, which I probably wouldn't do on my own. (Student 9)

The collaborative environment not only contributes to a great dynamic in class, but also has a long-term effect. It is significant to see some students take the community spirit with them to the next course, which is pointed out in one student's survey response: "My friends and I still think of funny ways to remember characters!" (Student 10).

5. It creates an easy access online platform with abundant resources and space for personalized learning. Students can access Moodle anytime to watch and share videos, as Student 11 said, "Yes, [Moodle was helpful], because everyone has access to the same resources and shares his or her learning strategies with each other." Students also have the autonomy to decide whose tutorials work better for them and at what pace they want to learn and process, as Student 12 stated, "It is helpful because it allows me to take the time and learn the character and make up a story for each one. Each character from the character video I have made I remember."
6. It boosts confidence in character learning, and encourages a positive Chinese learner identity. As many students above mentioned, the CCL project helped them overcome the seemingly impossible task of learning Chinese characters by understanding the components and creating their own connections to the characters. Expressing their thinking process and learning strategies through tutorial videos help them realize they really own the understanding, as one student explains, "Once I make a video about a character I feel more confident that I actually know it" (Student 13). With prior knowledge, learning new characters gets easier, as another student describes: "I have fully memorized stroke order and am able to write characters correctly without ever learning, doing the character learning exercises definitely helped me" (Student 14). Having positive experiences learning Chinese and Chinese characters gives learners a great sense of accomplishment and personal growth. As another student put it, "Honestly, learning Chinese (and its characters!) has helped me grow as a person!" (Student 15).
7. It allows more interactive and effective time use in class. Instead of giving one-way lectures, we can implement more integrative activities, such as conducting integrated and comprehensive activities that require teamwork, critical thinking, and the instructor's presence and feedback. One example is a library session that requires students to exercise stroke order and radical knowledge to look up words, use accurate pronunciation to type on the mobile device, and combine all the skills above to locate Chinese books in the library (shown in appendix 14.3).

CONCLUSION

As a common Chinese saying goes, "教學相長," meaning "to teach is to learn, and to learn is to teach." We believe the CCL project encourages students to bring their best knowledge and strategies into play by giving them the agency to explore and share. Through making their own character videos, students are able to individualize their character learning experiences and create a profound and lasting impact on their Chinese character literacy beyond the beginning level. This process of making videos not only benefits students' character writing but also other Chinese language capacities such as speaking and sentence writing. Furthermore, the video sharing with peers strengthens listening and reading proficiency and also creates a sense of community. In addition, student-produced videos lend an important assessment measure to the instructors and students themselves to provide real-time observation and deep understanding of their learning progress. In sum, the CCL project strengthens Chinese character literacy as well as overall Chinese linguistic literacy, enhances the quality of Chinese teaching, and improves the dynamic of the Chinese class.

All in all, this chapter aims to share what we have learned from the CCL project. We believe that giving students the ownership to explore their individual ways to learn and exposing them to a multimodal learning environment, while equipping them with needed tools and clear structure, are the keys to a wonderful journey of learning and teaching Chinese as a foreign language.

NOTES

1. FSI divides world languages (the list is not all inclusive) into four categories based on the level of difficulty for native English speakers. Arabic, Cantonese Chinese, Mandarin Chinese, Japanese, and Korean are the five languages in Category IV, all of which will take approximately eighty-eight weeks for English speakers to reach advanced level. The languages in Category I, such as French, Italian, Spanish, and Portuguese, will take twenty-four to thirty weeks. See https://www.state.gov/documents/organization/247092.pdf (accessed July 18, 2018).

The U.S. Interagency Language Roundtable also has similar categories. See http://www.govtilr.org/index.htm (accessed July 20, 2018). The four categories are quoted by Claudia Ross, "Chinese character literacy: From research to practice" in her paper presentation at the Five College Chinese Teaching Pedagogy Workshop, March 25, 2016, Smith College.

2. A Chinese radical (部首 *bùshǒu*; "section header") is a graphical component of a Chinese character under which the character is traditionally listed in a Chinese dictionary. Therefore, each Chinese character has only one radical that often is a semantic indicator, while the remaining components, if any, could indicate the sound,

image, or meaning of the character. Also see http://intensive-chinese.blogspot.com/2011/10/spatial-relations-among-radicals-in.html and http://www.chinaknowledge.de/Literature/Script/hanzi.html

3. See the website of Bryn Mawr College's Blended Learning in the Liberal Arts Conference, https://repository.brynmawr.edu/blended_learning/ (accessed July 18, 2018).

The website of Cornell University Center for Teaching Innovative provides a similar definition: https://www.cte.cornell.edu/teaching-ideas/teaching-with-technology/blended-learning.html#topic1 (accessed July 18, 2018). We have also consulted Barbara E. Walvoord's handout titled "Flipping the Class" from a workshop held at Smith College in spring 2013.

4. The public WordPress site (https://sophia.smith.edu/chinese-character-literacy/) noted at step 8 in figure 14.1 is developed in collaboration with Learning, Research, Technology (formerly known as Educational Technology Service) at Smith College.

5. All students' names in this chapter are pseudonyms.

6. The Chinese text in square brackets [. . .] is the author's revision or added information to provide clear context. Students' original narrations are left unedited if the errors are minor, unless we think the mistake may affect the understanding of the readers in which square brackets [. . .] will also be used to provide more information. Same method is applied to all quotations from students' narrations.

7. The minor errors in students' feedback were left unedited, unless we think it may affect the understanding of the readers in which square brackets [. . .] will be used to provide more information.

8. Students have presented CCL project at "Celebrating Collaborations" which is a campus-wide event that showcases and celebrates the scholarly work of Smith College students. Students present the results of their senior theses, independent study projects, research seminars, and other creative work as part of oral sessions, panels, poster sessions, exhibits, and performances.

9. Either formal discussions in class or informal discussions outside of classrooms.

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APPENDIX 14.1 PREPARATION SHEET FOR VIDEO-MAKING WORKSHOP (FIRST SEMESTER)

- For Group A: Find a character that is challenging to you from Lesson 1, and answer the following questions.
- For Group B and C: Pick one of the characters of your Chinese name, and answer the following questions.
  1. What radical does this character have? Is there any meaning correlation between the radical and the character? Please explain.
  2. What structure does the character have?
  3. What is the character's stroke order?

Think about how you are going to introduce it and write it down on your video script. At the character workshop, you will make a one-minute video introducing the character. The video can be as creative as you want, but don't forget to include the radical, structure, stroke order, and the meaning of the character.

APPENDIX 14.2 CHARACTER VIDEO ASSIGNMENT EXAMPLE (SECOND SEMESTER)

Pick one question from the Lesson 11 video assignment. Besides answering the question, you also need to *1) demonstrate the stroke order of the characters and 2) visually or orally highlight the radical(s).*

The length of the video should be about one-and-a-half to two minutes. Please write down your script before you start making the videos.

(1) Compare 气(氣) and 汽 and answer the following questions: a) What do they have in common? b) What are the differences? c) What's your strategy to distinguish these two characters?
(2) Compare 已 (已经/已經) and 己（自己）and answer the following questions: a) What are the differences? b) What's your strategy to distinguish these two characters?
(3) Explain the word 公园/公園, including each character's radical, stroke order, definition, and how the two character definitions combined to form the meaning of the word 公园/公園. If you have a strategy that helps you learn the word, please share it with the class too.
(4) Think about what phrases you have learned that include the character 预(預). What does 预(預) mean in these phrases? Can you find a new phrase that uses 预(預) in the same sense and introduce it in your video?

(5) You can also find other characters to do the similar comparison as above.

APPENDIX 14.3 EXAMPLES OF INTERACTIVE CHINESE CHARACTER LITERACY ACTIVITY (LIBRARY SESSION)

Task 1:

1. Type the answers to the following questions on your computer or phone.
   a) 你周末常常做什么?
   b) 你这个周末想做什么?
2. Use voice dictation/speech input function to write down the following sentences on your phone.
   a) Long time no see.
   b) What movies do you think are interesting?

Task 2: Use the handwriting input on online dictionaries to find the following information.

Character	*Pinyin*	*Radical*	*Definition & example word/phrase*	*Character structures*	*How many strokes?*
会					
空					
水					
来					
哪					

Author Created.

Task 3: Find the information for the following books in the library.

Books	*Chinese Breeze Graded Reader Series*	*Mandarin Matrix*	*Mandarin Companion Graded Readers*	*Where to find?*
《错，错，错！》				
《我可以请你跳舞吗？》				
《你的生日是几月几号？》				

Author Created.

2. Please find one to two more Chinese books that you want to read and share with the class.

Index

About the Contributors

Pei-ni Causarano received her PhD in educational linguistics from the University of New Mexico. Her research is informed by more than fifteen years of experience serving as a face-to-face and online Chinese and ESL instructor and curriculum developer, as well as clinical supervisor for pre-service teachers at the University of New Mexico and the University of Mary Washington. She is also a dual certified educator in Taiwan, New Mexico, Florida, and Virginia. Her research interests include cross-linguistic influences in SLA, L1 thinking in L2 speaking, online language teaching and learning, differentiation, and development of L2 literacy and heritage language. In her free time, she likes to practice yoga and observe thought and language in her trilingual boys.

Yalin Chen is a Chinese lecturer at Smith College. She teaches Chinese language courses at various levels while focusing on developing student-produced course projects. Students in her beginning level create short videos introducing Chinese characters through the Chinese Character Literacy project, and complete the first year with a video narrative project. The digital storytelling project is extended at the intermediate level when students integrate personal experiences and interests into evolving and reflective narratives. In the third year, students select topics and design Chinese magazines covering social, political, environmental, and cross-cultural issues. She is currently collaborating with her colleagues to implement the "Food Project," a theme-based teaching module, across different levels of Chinese courses.

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I-Chiao Hung, PhD, is a student at National Taiwan Normal University and was a teaching faculty at FLAME University. She taught at the Utah Chinese Dual Language Immersion Program at Riverview Elementary School during 2017–2018 and the beginning-level Chinese courses at Utah State University during 2015–2017. She graduated from the Master of Second Language Teaching program at Utah State University in 2017. Her academic interests are instructional technology and Chinese linguistics.

Justin Olmanson is an assistant professor of Instructional Technology at the University of Nebraska–Lincoln. His work centers on the design of learning technologies that make new things possible—particularly creative and participatory literacies and language learning practices. Justin leads a design incubator out of which affinity-based, heterarchical teams emerge to design, prototype—and sometimes develop and implement—technologically mediated environments aimed at creating more generative language and literacies experiences and more complex learning ecologies. This work involves ongoing inquiry at the intersection of societal (meta)narratives, equity, education, learning, technologies, and design.

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