Using Technology-Supported Enrichment Activities to Extend Student Learning in a Chinese as a Foreign Language Classroom

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ABSTRACT

The purpose of this study was to investigate whether exposing middle school students to content above their ability level produced significant differences in students' confidence in their Chinese as a foreign language competence in each of the following four areas: reading, listening, speaking, and learning vocabulary. Participants (N = 30) were sixth and seventh graders. Results of paired t-test analyses indicated that there was no significant difference in student confidence in Chinese reading competence, $t(30) = 0.78$, $p = 0.22$; in Chinese speaking competence, $t(30) = -0.50$, $p = 0.31$; or to learn Chinese vocabulary, $t(30) = -0.80$, $p = 0.21$. However, there was a significant difference in student confidence in ability to learn Chinese listening, $t(30) = -1.78$, $p < 0.05$. It is suggested that exposing students to content well above their ability level can increase their confidence in ability to learn Chinese listening.

Keywords: Mandarin Chinese, foreign language learning, curriculum, student confidence, pedagogy

Introduction

World language instruction is critical to economic and strategic interests of the United States. The benefits of studying a second language (L2) go beyond improved cultural awareness and cross-cultural understanding and attitudes. Compared to monolingual students, students who receive consistent bilingual education demonstrate better print awareness (Bialystok, 1997), better linguistic awareness (Demont, 2001), better native language vocabulary (Cunningham & Graham, 2000), better math achievement (Armstrong & Rogers, 1997), and better scientific reasoning (Kessler & Quinn, 1980). Bialystok (2005) reviewed research on bilingualism and cognitive development and concluded that bilingual education facilitates the development of a general cognitive function concerned with attention and inhibition, and this explains why bilingual children outperform monolingual children on tasks and processes that require such a function most. With a growing awareness of the value of bilingualism, states and school systems have elevated requirements beyond minimal competencies for honors diplomas and graduation and expanded instruction beyond the most commonly studied languages of French, German, Latin, and Spanish to include other foreign languages such as Chinese.

Computer technologies and the Internet can be instrumental in second language instruction. Technology has become a core source of content and a conduit for authentic language learning experiences. All language textbook publishers offer multimedia components for their books, some more elaborate than others. Technology-enabled hybrid and online language courses provide much needed flexibility for students who cannot enroll in traditional face-to-face classes due to transportation issues or scheduling conflicts. Computer and video games such as memory matching puzzles, hang‑ man, crosswords, and word‑ search puzzles, are often found within larger language software programs, particularly those for children. In addition, a number of unstructured online activities, including public forums, fan fiction, social media sites and multiplayer games, have been found to be valuable language learning opportunities. For example, Mentira (Holden & Sykes, 2011) is a place‑ based murder mystery video game set in Albuquerque's Spanish old town, and Trace Effects (Bikowski, 2012) is a video game with a time‑ travel theme for ESL students to explore American language and culture in an online 3D environment. Mobile devices play a prominent role in facilitating these unstructured activities.

Computer-assisted language learning (CALL) has evolved as a promising paradigm of instruction and research. Levy (1997) described a dichotomy between tutorial CALL (programs that substitute for the teacher in delivering language instruction, practice, and evaluation) and tool CALL (the use of generic productivity, e‑ learning, and digital media creation applications for teaching). Generally speaking, tutorial CALL has gradually lost ground to tool CALL and the term authoring has broadened to include design of tool‑ based instructional experiences (Otto & Pusack, 2009). Teachers of the 21st century are increasingly expected to have the competence for building instructional platforms to enable a variety of student language learning experiences, using programs such as Microsoft Office, course management systems, Web teleconferencing tools, streaming media resources, animation and digital storytelling apps, and social apps.

The effective use of technology-based tools in second language instruction requires the thoughtful application of pedagogy. CALL scholars have described this evolution of CALL using different terms and approaches. For example, Warschauer and Healey (1998) proposed three stages of CALL development based on the technologies and pedagogical approaches: Stage 1-Behaviorist; Stage 2-Communicative; Stage 3-Integrative. Sociocultural theories have great influences on language instruction, viewing the learner as a social being whose cognitive and linguistic development occurs through social interaction mediated by language. Consistent with the sociocultural perspective, computer mediated communication (CMC) is considered particularly effective for promoting students' intercultural awareness and intercultural communication skills. In recent years, educational models have largely shifted away from exclusively teacher‑ centered classrooms toward student‑ oriented, active and collaborative learning environments, with the student as creator of digital texts and media and (co-)constructor of knowledge, both in and out of the classroom. In a systematic review of a century of research, Otto (2017) describes a gradual evolution in technology facilitated L2 instruction from teacher-centered approaches that rely heavily on the delivery of digital media enriched language lessons, practices, and testing, to student-centered approaches that emphasize "communicative, collaborative, and creative language learning experiences" (p. 19) on interactive platforms accessible any time any place via wireless mobile devices (e.g., laptops, tablets, and smart phones). "Researchers have begun to explore how students interact in such environments, construct new identities, and learn language and culture through these experiences" (Chapelle & Sauro, 2017, p. 20).

The practice of exposing students to challenging material as part of their learning process is as old as teaching. In the area of foreign language learning, recent ACTFL standards emphasize "…language learners are helped to perform at the next range by learning to use language at that next level", and "instructors should consider recycling content and contexts at the next higher level of functions, providing multiple opportunities for learners to expand into the next performance range, developing stronger language control, vocabulary, communication strategies, and cultural awareness" (ACTFL, 2012, p. 10). Numerous studies support the pedagogical approach recommended by ACTFL. For example, in a literature review, Hummel and French (2010) discussed how text-based activities such as reading aloud *difficult* content might benefit phonological memory function for second language acquisition, by serving as a rehearsal and repetition to facilitate encoding the content to long-term memory and build a foundation of basic language fluency skills, especially vocabulary acquisition skills. Rodrigo, Krashen, and Gribbons (2004) pointed out the importance of exposure to both reading and oral input above a student's comprehension level in language learning, and argued that context and guessing strategies can be important tools in teaching and learning a foreign language. Cunningham and Stanovich (1991) indicated that immersing children in authentic literature from their earliest encounters with print could contribute to their development of decoding skills, improve the efficiency of the phonological short-term memory, and therefore enhance early oral vocabulary acquisition. Cunningham and Graham (2000) found that immersive experience facilitated both native language and foreign language acquisition among Spanish learners.

These studies focused on mechanisms that may increase students' learning – practices that help them transfer their new language learning content to long-term memory, mastery of strategies using context and guessing to decode unfamiliar material, and improving the efficiency of short-term memory to aid in vocabulary acquisition. A different but related question has to do with the effects of such practices on students' confidence in their ability to learn a new language.

Although the benefits of L2 education are increasingly recognized in the United States, the effectiveness of existing L2 programs remains questionable. Compared to students in many other countries, U.S. students seem to underperform in L2 skills and related cultural competencies (Awad, 2014). U.S. professionals who work in multicultural environments have been found to lack foreign language proficiency (Met, 2004). One of the factors that undermine the effectiveness of foreign language education in the U.S. is the lack of motivation and confidence among the learners. Unlike the typical Europeans who view multilingualism as part of their life and tend to be intrinsically motivated to learn foreign languages, Americans often assume that everyone speaks English and see limited value of L2 study (Bartram, 2010). American L2 learners also tend to lack self-efficacy for learning a second language (Spurling, 2014). According to Bandura's Social Cognitive Theory (Bandura, 1977, 1997; Maddux, 2016), how students perceive their ability to successfully perform a specific task (i.e., *self-efficacy*) is not only related to their motivation for learning but also highly predictive of their subsequent engagement, strategy use, and achievement in academic settings (Pajares, 1996; Pajares, 2003; Schunk & Zimmerman, 2003). In order to advance L2 education in the U.S., it is therefore critical to find effective ways to improve students' self-efficacy for acquiring specific L2 competencies.

The purpose of the present study is to examine the impact of a technology-facilitated scaffolding intervention on students' self-efficacy for learning Chinese as a second language in four different aspects: *reading*, *listening*, *speaking*, and *learning vocabulary*. Our intervention involves exposing Chinese as a second language middle school students to Chinese content

above their ability level in a technology facilitated L2 classroom that incorporates the use of web-based multi-media materials, online Flashcards, and computer games. We hypothesize that students will show higher self-efficacy in each of the four aspects of Chinese learning after receiving such an intervention for six weeks.

Methods

Context of the Study

The present study is an action research led by a pre-service teacher of Chinese as a second language in a Midwestern U.S. suburban public middle school, during a semester of student teaching. The school has a high percentage of African American students, students from low socioeconomic status (SES) backgrounds, English language learners, and special-needs students. The school has been offering a foreign language course named "Introduction to Chinese". This course takes one year to complete. Our student teacher was teaching this course under the supervision of her mentor teacher. At the time of our study, the course had four sixth-grade classes and four seventh-grade classes. All classes met for 42 minutes every other day. Enrollment in these classes ranged from 4 to 10. Since students enrolled in this course typically started with little Chinese language proficiency, the regular Chinese teacher (mentor teacher) and the students used to speak English 90% of the time. Students had little or no exposure to the Chinese language outside of the classroom, either. It has been observed that many students taking Introduction to Chinese lacked both motivation and confidence. They saw little use of Chinese language in their everyday life. They indicated that Chinese language sounded "weird" and they felt "awkward" when they tried to pronounce Chinese words.

The study took place in the middle of a spring semester, after the participants had completed one full semester of Chinese learning in the fall semester. The intervention focused on current learning content of the class, *numbers* and *counting*. The learning unit for the intervention was adopted from the MeiZhou Chinese textbook Level 1 (MeiZhou Chinese Editorial Team, 2006). This unit contains the main text of a story and a song. The text of this unit contains not only numbers but also some Chinese characters that the students have learned previously and were likely to recognize, such as "小 xiǎo," "上 shàng," "下 xià," "不 bú," " 好 hǎo," "再 zài," "是 shì," and "他 tā." At the same time, the text contains Chinese characters that the students were unfamiliar with and seemed to easily confuse with learned characters that have similar pronunciations, such as "数 shǔ" with "鼠 shǔ", "没 méi" with "美 měi", "得 de" with " 的 de", "走 zǒu" with "猪 zhū", and "急 jí" with "几 jǐ". We deemed that the selected text was appropriate for the purpose of the study because it is an authentic, meaningful Chinese text whose difficulty level is just above the students' actual level of performance. The text comes with a variety of technology-enabled instructional tools and activities that are free to download and/or use online by teachers and learners around the world (http://www.mzchinese.net/Resources/Resource-traditional-Lesson1.html). For the purpose of the present study, the teacher implemented the use of web-based text, web-based video for the story, web-based audio for the song, online Flashcards, online Chinese-English word matching game, and group-based PowerPoint-enabled quiz competition that mimics Jeopardy game.

Sample

A total of 31 middle school students enrolled in the course "Introduction to Chinese" participated in our study. The participants consisted of 11 sixth graders and 20 seventh graders, 15 males and 16 females. In terms of race/ethnicity, there were 15 African American students, 6 White/Caucasian students, 6 multi-racial students, 3 Asian American students, and one Jamaican student. Among the 31 participants, 28 students had English as their native language, 2 students had Nepali as the primary language spoken at home, and one student specified Jamaican (probably patois) as the primary language spoken at home. None of the students had Chinese as the primary language spoken in the home. All participants were in the free and reduced-price lunch program.

Instruments

Identical pre and post questionnaires were administered to the participating students. The questionnaire has two sections. The first section has demographic questions about the student's grade level, age, gender, race/ethnicity, primary language spoken at home, level of Chinese study, and amount of time spent on Chinese learning. The second section consists of a measure of Chinese language learning self-efficacy. This is a Likert-type scale adapted from an instrument developed by the National Foreign Language Resource Center (2000) for measuring self-efficacy for foreign language learning. The adapted scale consists of 20 questions, 5 for each of the following four areas: reading, listening, speaking, and vocabulary. The rating scale ranges from 0 (not sure at all) to 100 (completely sure). Students were asked to rate how sure they were of their ability to complete specific Chinese learning tasks in each area. Examples of Chinese learning tasks are: understanding the gist of a statement; figuring out the meaning of words or phrases that one does not understand; retelling a Chinese statement in English.

Procedure

The student teacher implemented the intervention during six consecutive class sessions of the "Introduction to Chinese" course. The intervention activities varied for each of the six sessions. Below we describe the specific activities for each session:

Session One: The instructor handed out photocopies of the four-page selected text from the textbook to the students, projected the text onto the Smartboard, and played an audio recording of the text on the publisher's website. The instructor paused the audio player at the end of each sentence and had the students read it out aloud together. The instructor then asked students to share with the rest of the class any Chinese character, word, or sentence from the text they had understood. The instructor reviewed those characters and words and introduced new ones that students were unfamiliar with. Next the instructor played the whole audio recording in one setting and asked the students to guess what the story was about. Without correcting them, the instructor played the web-based video to illustrate the storyline. Students were encouraged to listen to the audio recording and watch the web-based video as many times as they want to at home, via the links provided by the instructor.

Sessions Two through Five: During sessions 2-5, the instructor introduced a new page of the text per session. The same procedures were followed during each session. First the instructor projected the text onto the Smartboard and played an audio recording of the text on the publisher's website. She had the whole class read out aloud upon hearing the audio recording of

every sentence. She also had boys (all together) and girls (all together) alternate during the read-aloud. Next, the instructor circled the key nouns, key verbs, and key terms on the text using the Smartboard. She used hand gestures, facial expressions and body language to guide students to figure out the meanings of the unfamiliar Chinese characters or words on their own. After this, the instructor asked the students to discuss what the story was about and played the web-based video based on the story. Finally, for drill and practice purpose, the instructor engaged the whole class in online Flashcard game, and online Chinese-English word matching game. Students were told to access the audio recording and video, and practice newly learned Chinese words and characters by playing online games on their own at home, via the links provided by the instructor.

  <u>Session Six</u>: The instructor went through the same initial procedure and called on individual students to read out aloud upon hearing the audio recording of every sentence in the text. The instructor conducted an informal oral assessment to determine each student's comprehension of the whole text. She asked all students to read the text out aloud at their own pace, without playing the audio recording or having students repeat after the audio recording, and then had each individual student read the entire four-page passage aloud at their own pace. To wrap up the six-session intervention, the instructor divided the students into two teams and had them compete against each other in a group-based PowerPoint-enabled quiz game that mimics the Jeopardy game.

  The participants completed the pre-survey prior to the beginning of the intervention. At the conclusion of the intervention, all participants completed the identical post survey. The Chinese language instructor administered both surveys in the classroom.

Results

  All the participants (N=31) completed both the pre-survey and the post-survey. One of them gave the same answer to all the post-survey questions and was excluded from the data analysis. The final sample thus consisted of 30 students.

Tabel 1. *Means and Standard Deviation of Student Ratings Before and After Intervention*

Variables	Pre-intervention		Post-intervention	
	Mean	*SD*	*Mean*	*SD*
Confidence in ability to learn Chinese reading	264.50	76.67	253.00	81.71
Confidence in ability to learn Chinese listening	244.83*	81.64	266.33*	69.13
Confidence in ability to learn Chinese speaking	250.67	81.47	257.83	75.40
Confidence in ability to learn Chinese vocabulary	284.00	90.03	298.33	98.47

Notes. N = 30. SD = standard deviation. * $p < .05$.

  In order to investigate if there were significant differences in student confidence in their ability to learn Chinese in each of the four areas (i.e., reading, listening, speaking, and vocabulary) before and after the intervention, we conducted a series of paired *t*-tests. Table 1

shows the means and standard deviations of student ratings before and after the intervention. The results of the paired *t*-tests indicate that there was no significant difference in student confidence in ability to learn Chinese reading, $t(30) = 0.78$, $p = 0.22$, in student confidence in ability to learn Chinese speaking, $t(30) = -0.50$, $p = 0.31$, or in student confidence in ability to learn Chinese vocabulary, $t(30) = -0.80$, $p = 0.21$. However, we found that there was a significant difference in student confidence in ability to learn Chinese listening, $t(30) = -1.78$, $p < 0.05$.

Discussion and Conclusion

While Mandarin Chinese is becoming a global language (Ingold & Wang, 2010), and Mandarin was the second most popular foreign language offered in U.S. public schools in 2013 (Markell & Herbert, 2016), learning Chinese can be quite challenging for American students accustomed to an alphabetic, non-tonal language. Understanding spoken Chinese (i.e., *listening*) is one of the hardest skills in learning Chinese as a second language. The current study examined the effectiveness of a technology-facilitated scaffolding intervention that exposed American students to authentic Chinese content above their current ability level in a middle school Chinese as a second language class. The intervention was designed to take advantage of a web-based platform with digital texts of various difficulty levels, complementary audio and video materials, and web-based flashcard/quiz/game activities. The results indicated that the technology-facilitated intervention seemed to have a greater impact on student self-efficacy in one area of Chinese language learning (i.e., *listening*) than it had on the areas of *reading*, *speaking*, and *vocabulary acquisition*.

This study provides partial support to our hypothesis that exposing students learning Chinese as a second language to Chinese language content above their current ability level in a technology-facilitated learning environment can significantly increase student self-efficacy for learning Chinese as a second language. While significant improvement was only found in one of the four areas of Chinese learning, our findings were still encouraging considering the relatively short duration of the intervention, and the no cost instructional materials via the publisher's website. With the rapid development of high-speed Internet and advanced instructional technology, including virtual reality and wearable devices, our study seems to support the boundless potential of technology-facilitated teaching and learning approaches in learning Chinese as a second language.

It should be noted that our study has a number of limitations that influence the generalizability of our findings and suggest areas for further research. First, the sample consisted of all middle school students of low socio-economic status and the sample size of 30 was relatively small. The findings may not be generalizable to student populations of a different socio-economic status. Second, the intervention only lasted six sessions. If we had implemented the intervention over an extended period of time such as a semester, its impact on Chinese learning could have reached statistical significance for all four areas instead of only one area. Third, the content we used for the intervention was limited to one unit from a digital textbook and accompanying web-based multimedia instructional materials. It is unknown whether other methods of exposing the students to such content, or the use of different Chinese learning content, would have produced similar results. Future research may consider the adoption of different instructional content and/or different ways to expose students to content above their ability level. Fourth, this study was a pre-post single group design and did not include a control group. No data were gathered from students in similar Chinese classes who experienced the same

curriculum during the same time frame, but who were not exposed to content above their ability level. It is conceivable that the increase in student confidence for Chinese learning tasks in the area of listening was due to taking the Chinese course and spending more time on learning Chinese, instead of the intervention. Future studies should consider adding a control group that receives no intervention. Finally, it is worth noting that this study examines students' <u>self-efficacy</u> for successfully completing certain Chinese learning tasks as the outcome. A cautionary note is needed so that we should not confuse self-efficacy with students' actual achievement. Further research should include measures of students' actual achievement level in Chinese as a second language learning. More research is needed to examine better ways to design and implement technology-facilitated instructional innovations for promoting Chinese as a second language learning among American students while addressing such limitations.

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