

**Exploring the affordances that technology provides for heritage learners of
Chinese as a foreign language (CFL)
--The case of online chat**

by

De Zhang

A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
MASTER OF SCIENCE

Major: Education
(Curriculum and Instructional Technology)

Program of Study Committee:
Niki E. Davis, Major Professor
Marcia H. Rosenbusch
Barbara S. Schwarte

Iowa State University
Ames, Iowa
2004

Copyright @ De Zhang, 2004. All rights reserved.

Graduate College
Iowa State University

This is to certify that the master's thesis of

De Zhang

has met the thesis requirements of Iowa State University

Signatures have been redacted for privacy

To Peilan

Table of Contents

List of Tables	vi
List of Figures	vii
Abstract	viii
Chapter 1. Introduction	1
Purpose and Background of the Study	1
Introduction to the Chinese Language	3
Context of the Study	6
Implementation of the Technologies in the Class	8
Significance of the Study	13
Preview of the Thesis	14
Chapter 2. Literature Review	15
Theoretical Foundations	15
Scaffolding Learning	16
Situated Learning	17
Interaction and Networked Communication	18
Online Chat in Language Learning	19
Social Interaction and Peer Interaction in Learning	20
Summary	22
Chapter 3. Methodology	24
Research Design and Its Rationale	24
Research Context and Participants	26
Data Collection	30
Data Analysis Procedures	33
The Role of the Researcher	34
Trust-Building and the IRB	35
Establishing Scientific Trustworthiness	36
Summary	37
Chapter 4. Findings and Discussions	39
Heritage Learners' Perception of the Affordances of the Chat	39
Chat Accelerated the Chinese Learning Process	40
Chat brought Fun to the Class and Enhanced Motivation and Interest In Learning Chinese	47
Course Instructor and Designer's Perceptions of the Affordances of Chats	50
Online Chat was an Effective Instructional Tool	50
Online Chat was an Effective Assessment Tool	51
Online Chat Logs were Valuable Instructional Materials	51

Chat Rooms were Good Student-Centered Learning Environments	52
Chat Accelerated the Overall Quality and Quantity of the Course Instruction	53
Chapter 5. Conclusions and Implications	55
Summary of the Findings	55
Limitations of the Study	57
Implications for Further Teaching and Research	58
Conclusion	58
Appendix A: Glossary of Terms	59
Appendix B: Consent Form	61
Appendix C: Sample Instructions on Reflective Journals	63
Appendix D: Peer Review of Research	64
References	65
Acknowledgements	73

List of Tables

Table 1: Profiles of the 4 Participants	29
Table 2: Data Sources	31
Table 3: Research and Related Activities	32
Table 4: Students' Progress Shown in Mid-Term Exam on 10/10/2003	43
Table 5: Lengths of the Participants' Reflective Journals	46

List of Figures

Figure 1: A View of the Cargill Digitally-Enhanced Classroom	9
Figure 2: A View of the Cargill Digitally-Enhanced Classroom	9
Figure 3: The Homepage of the WebCT Online Environment	10
Figure 4: The WebCT Chat Rooms	11
Figure 5: The Chinese Chat Room—Chinese World	11

Abstract

This thesis reports an interpretative case study investigating the use of online chat in a blended Chinese language course. The course combined online learning and face-to-face instruction at the college for heritage learners, who, because of their Chinese family background, commended certain conversational skills but had limited reading and writing skills or not at all. The goal of the study was to identify the affordances of online chat perceived by heritage learners, the course instructor, and the course designer. The major research question this thesis study aimed to address was: how does online chat help heritage learners with their learning of Chinese?

In this study, I worked as the co-designer and technical support person of the course, and a participant researcher. Four heritage learners were selected as representatives of heritage learners in college classrooms in the United States to participate in this study. The participants' interviews, chat logs, written assignments including reflective journals, and the researchers' observations notes, were the data sources. The instructor's and the designer's perceptions of the use of online chat in this class were also examined.

Research findings demonstrated that online chat was powerful in accelerating the heritage learners' learning of Chinese and in enhancing the instruction of Chinese. The chat in Pinyin appeared to scaffold heritage learners' acquisition of Chinese characters in the early stage. In addition, the application of online chat generated pedagogical innovations in the Chinese language classroom.

Chapter 1. Introduction

This thesis reports an interpretative case study investigating the use of online chat in a blended Chinese language course. The course combined online learning and face-to-face instruction at a college level for heritage learners, who, because of their Chinese family background, commanded certain conversational skills but had limited reading and writing skills or none at all. The goal of the study was to identify the affordances of online chat perceived by heritage learners, the course instructor, and the course designer. The major research question was: How does online chat help heritage learners with their learning of Chinese?

This chapter provides an introduction to the purpose, background, context and significance of the study. Also provided is information about how to write Chinese on a computer and an overview of the entire thesis is also provided.

Purpose and Background of the Study

The purpose in doing this study was congruent with my strong interest in the promises technology holds in education in general, and in language education specifically. My graduate coursework in second language acquisition and educational technology had naturally engaged me in technology integration in the second/foreign language classroom. As an international student from China, I feel that my understanding of the differences in the American and Chinese cultures, and the two educational systems I had experienced, gave me a critical eye for the issues I would explore in my research. Furthermore, having learned and taught English as a foreign language in China with very traditional grammar-translation and audio/lingual approaches under a test-oriented curriculum, I have realized that these traditional approaches usually tend to make language learners accumulate inert knowledge. In language learning, the inert knowledge may be the isolated skills and vocabulary and grammar rules gained mainly through mechanical memorization. In spite of their high scores on language tests in schools, language learners who have accumulated inert knowledge may demonstrate low communicative competence in the real world. I have great passion and high expectations for the power of technology to innovate the foreign language curriculum and significantly enhance students' learning.

The two research methods courses I completed in 2003, Action Research in Education and Qualitative Research Methods, led me in the direction of a qualitative research paradigm and further aroused my interest in practicing the qualitative research paradigm in my thesis study. Therefore, the main purpose of this study was to seek pedagogical innovations in language education with technology integration and to fully explore, by adopting a qualitative research approach, the possibilities technology may provide to the language learners.

The research opportunity arose when a Chinese professor invited me to be a co-designer and technical support person for an experimental course offered to heritage learners for the first time in the fall of 2003 at a Midwest university. Thus, I was able to learn about the teaching of Chinese as a foreign language in the U.S. to heritage learners of Chinese. The challenges that exist in teaching Chinese as a foreign language (CFL) in the United States drew so much of my attention that I decided to pursue solutions to the problems by integrating technology into the curriculum and doing research on the impact of technology on the learners and instructors. This thesis study was my initial attempt.

In recent years, with the increasing number of Chinese immigrants, a substantial body of the Chinese language learners at all levels are heritage students who usually possess unbalanced Chinese language skills. At the college level, heritage learners are typically students who have certain speaking proficiency but underdeveloped reading proficiency (Douglass 2001, Dumitrescu, 2000, as in Matunaga, 2003). Heritage language acquisition and the education of heritage language learners, especially at the college level, are emerging as an increasingly important field (Kondo-Brown, 2003). The effective education of heritage learners has been considered a new challenge and an urgent priority issue in the field of Chinese as a foreign language (CFL) (Schrier & Everson, 2000; Wang, 1996). So far, studies on education of heritage learners with technology integration into the classroom are hard to find. Studies on the use of technology by either traditional or heritage learners of Chinese language was not found in the research review for this

study. Therefore, a study on the education of heritage learners of Chinese with the integration of technology into the classroom would be timely and valuable.

Further, in the field of CFL in the United States, grammar-translation and audiolingualism have been widely used for a long time (Chi,1996). The field of teaching Chinese as a foreign language has been experiencing severe challenges, all of which are very common in the whole foreign language education area, especially in the context of higher education in the United States: a very weak tradition of language pedagogy research, out-of-date teaching approaches, and somewhat uninformed instructors on the latest research findings in language classroom teaching (Chi, 1996; Chu, 1996).

By integrating technology into the Chinese language classroom and completing research on the impact of the technology in the classroom, I aim to present solutions to the existing problems and bring some pedagogical innovations to the field.

Introduction to the Chinese Language

The sound and writing system

As is well-known, written Chinese is not an alphabetic language. The written form of the Chinese language, i.e. characters, developed from the pictographs cut on oracle bones dating from over 3,000 years ago. In China's long history, because of political, historical and geographic reasons, Chinese language, both its sound and written forms, has developed and evolved in a very complicated way resulting in many variations.

In 1950s, the People's Republic of China (Mainland China) simplified the writing system by either reducing the number of the characters (mainly through the elimination of the complex variants) or reducing the number of the strokes of which a complex character is composed (by the popularization of the simplified characters). In Mainland China, the simplified Chinese characters are used. But in Taiwan, Hong Kong and many other areas of Chinese populated areas, traditional Chinese characters are widely used.

In 1958, the People's Republic of China adopted Scheme for the Chinese Phonetic Alphabet (Hanyu Pinyin Fang An). The scheme is a set of symbols used to transliterate Chinese characters and combine the speech sounds of the common speech (Mandarin Chinese) into syllables. Latin alphabet was modified in the Scheme to meet the needs of the Chinese language. The scheme was aimed to form the foundation for the creation of a Chinese alphabetic system of writing, and to facilitate the learning of Chinese characters all over the country, and further to help unify pronunciation and popularize the common speech (Mandarin Chinese).

The Chinese language has been considered very difficult to learn by native speakers of other languages, especially European languages, mainly because of its complicated language writing systems and numerous dialects, and Chinese language teachers are believed to face a challenge more complex than those facing teachers of any other foreign language in the American educational system (Moore, et al 1992). Chinese is a non-alphabetic language and has difficult and different phonetic and writing systems from many other languages. Written characters are representations of Chinese language that bear no similarity to English orthography.

As introduced above, Pinyin is the Chinese sound/phonetics system. Pinyin symbols are Romanized letters, but they do not necessarily have the same pronunciations as the English letters. Therefore, in learning the Chinese language, the learners appear to deal with two separate language systems: the sound system and the writing system. Unlike English and many other phonetic languages in which there is little distance between speaking and reading or between reading and writing, the Chinese language unavoidably presents a large gap between speaking, reading, and, especially, writing.

Learning to write Chinese characters by hand stroke by stroke is very time consuming and difficult for learners since the correct order and number of the strokes in each Chinese character must be mastered. The mechanical memorization of Chinese characters presents a large challenge and takes so much instruction time that effective recognition and meaningful reproduction, in both oral and written forms, are often neglected. Thus, students can only learn a limited number of

Chinese characters within a specific period of time, which inevitably slows their progress in achieving overall proficiency in the language. The difficulty in learning to hand write Chinese characters has been considered the greatest hindrance to all Chinese second/foreign language learners, including those heritage learners, who, because of their Chinese family backgrounds, usually already possess some oral/aural proficiency and would otherwise be able to make rapid and comprehensive progress in all language skills if not for their lack of competence in character writing.

Writing the Chinese language on a regular computer keyboard:

The Pinyin Input Method

With the emergence of the personal computer, many computer engineers and Chinese language researchers and educators have worked on ways to enable people to write Chinese characters on the computer. A variety of keyboard inputting methods for Chinese characters have been designed. The keyboard input methods can be classified into three main types: by encoding, by pronunciation, and by structure of the characters. Here I would like to introduce a widely used method among learners of Chinese, the Pinyin Input Method, which belongs to the category of pronunciation in Chinese character keyboard inputting methods. This is the method we used in the class in which my study was conducted. This method is usually a favorite for learners whose native language is a European language because Pinyin symbols are Romanized letters.

The Pinyin Input Method involves inputting the Pinyin symbols of the characters on a regular computer keyboard and requires the user to select a character from a menu generally have sophisticated methods for guessing which characters the user intends based on context

When writing the Chinese characters on the computer, the students use the Chinese word-processing software (Chinese Pinyin Input Method) to write the characters through the following two steps:

1. Inputting the Romanized letters (pinyin symbols) representing the sound of a Chinese character on a regular keyboard.
2. Choosing the intended character from among a small group of different characters with the same sound.

The following example demonstrates how the Pinyin input system works to help the learners reproduce Chinese characters on the computer screen. I want to write the character “one,” so I type the pinyin symbols “yi.” Then, on the screen I see a list of Chinese characters with the same sound “yi.” The character I need is the first character with the first tone.



Thus, Pinyin has been the first and the most important step in writing Chinese characters on the computer screen through the Pinyin input system

Context of the Study

This thesis study was done in the fall semester of 2003 in an experimental college level Chinese language class taught at a Midwest university. At this university, educational technology receives much attention from the faculty and staff and is widely used on campus. Computer labs are easily available in each college or department building and in public facilities, such as the library. The Curriculum and Instructional Technology graduate program of which I am a member is strong in providing a leadership role state- and nationwide. The Instructional Technology Center at this university provides support and training to faculty and staff campus wide. In the Department of Foreign Languages and Literatures, a digitally-enhanced

classroom opened in the fall of 2002. The classroom was funded in part through donations from Cargill, Incorporated through its Higher Education Initiative which has been seeking to build mutually beneficial partnerships with select universities and academic programs relevant to the future of Cargill's business. The facility contains 23 student computer workstations and one instructor workstation hooked to the Internet, a SMART board, and an Internet-based video conferencing system (Polycom). Furthermore, a language lab equipped with audio/visual stations and computers is open for about 12 hours a day to the language learners in the department.

The 12 students in this Chinese class were from seven countries. Their age range was from 19 to 23. At least 80% of the students in this class have either a laptop or personal computer.

To make the case study as solid and reliable as possible, very careful sampling methods were applied in the choice of participants. Four heritage learners were chosen as participants in the case study. Two of the four participants in this study had laptops, and the other two had personal desktop computers in their dorm rooms. All four participants had completed classes using WebCT in the past.

To explore the best possibilities and affordances that technology may offer and to seek the optimal pedagogical innovations, the instructor and I designed this course as blended: a combination of a mainly WebCT-supported online learning environment and the conventional face-to-face instruction setting. WebCT is an integrated e-learning environment that allows the development of online courses without extensive programming knowledge. It provides learning, communication, collaboration, management, and design tools. Among the groups of powerful WebCT tools, communication tools in WebCT have received the most attention and heaviest use in the study class, because those tools provide the language learners the opportunities to interact and develop crucial communicative competence.

I worked as a co-designer and provided technology support for this class. I sat in on most of the face-to-face instructional sessions and all of the online chat sessions.

This was the first time that the instructor taught a Chinese language class in a blended way. She had been teaching Chinese as a foreign language and literature classes in the U.S. for more than 10 years.

Chinese courses had been offered on this campus for more than 5 years. A minor in Chinese Studies was approved in June of 2002 to meet the needs and demands on campus. The instructor received strong administrative support from both the College of Liberal Arts and Sciences and the Department of Foreign Languages and Literatures during the offering of an experimental course in Chinese language. The instructor had the freedom to decide what kind of course she wanted to offer and the way she wanted to teach the experimental course.

Implementation of the Technologies in the Class

This Chinese language course was taught in a technology-rich environment, blending online learning and face-to-face instruction. Online chat was not introduced as a separate or isolated intervention in this study. Rather online chats were naturally part of the class activities in this blended course. The technology-rich learning environment for this course consisted of the following major parts.

I. The digitally-enhanced classroom for face-to-face instruction

Figures 1 and 2 (below) show the face-to-face meeting sessions in the Cargill digitally-enhanced classroom. Every student sat in front of a computer, facing each other. The instructor could use the SMART Board for lecturing or demonstration of any software.

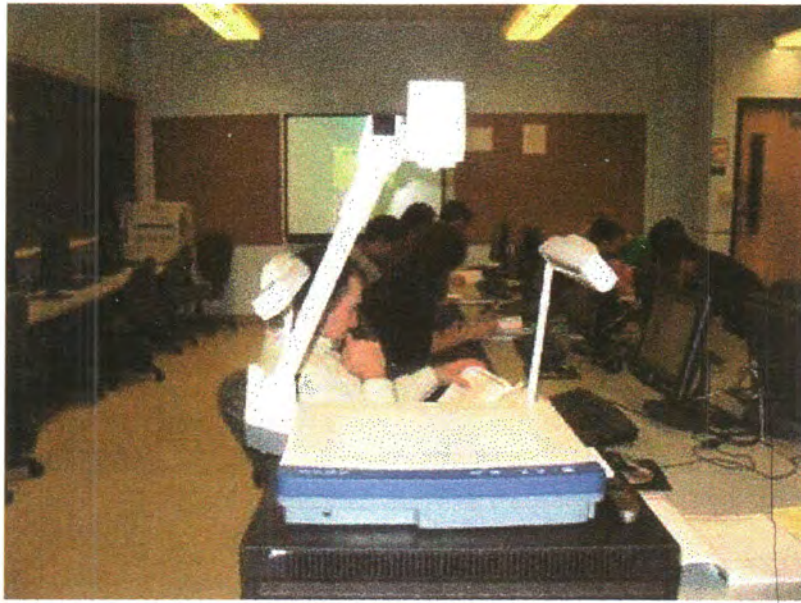


Figure 1: A view of the Cargill digitally-enhanced classroom used for the study

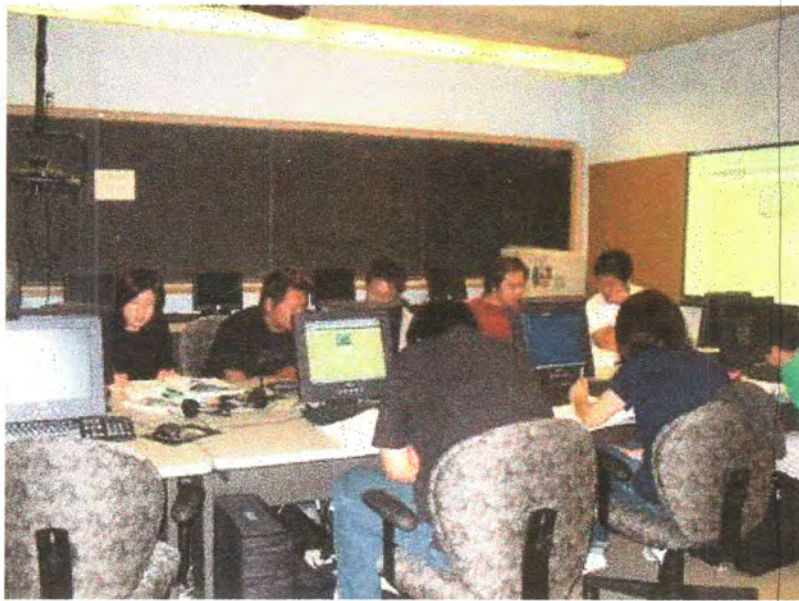


Figure 2: A view of the Cargill digitally-enhanced classroom used for the study

II. WebCT-supported online learning environment

We used WebCT to support the online part of the course. Picture 2 is the homepage of the course revealing the major WebCT tools we used in the class. The students logged into this online environment regularly to participate in the class activities such as online chat, discussions, submission of their assignments. There were online learning resources located and accumulated by themselves or recommended by the instructors, and some of the students' good written assignments shared in the "Course Content" area, which served as an electronic mini-library on Chinese language and culture for this class. Daily announcement of the class activities and homework were available in the "Calendar". The instructor and the students used WebCT email to communicate for any class related questions and issues. The students' grades in "Grade" and the projects in "Presentation" were available online, too.

Major activities students did in this classes included online chats, threaded discussions, electronic submissions of all the written assignments.

Chinese 205X: Accelerated Intermediate Chinese

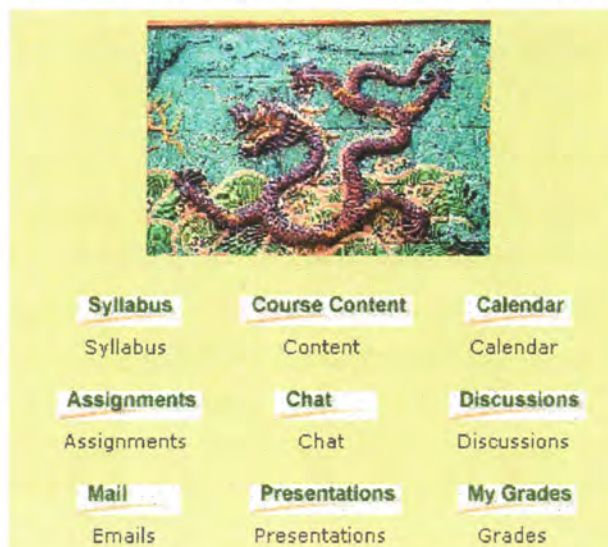


Figure 3: The Homepage of the WebCT online environment

III. The Chat rooms used in the class

Totally the students have five online chat activities during the fall semester of 2003. Three were done in the WebCT chat rooms in which the students could only type and chat in Chinese Pinyin symbols. Picture 3 shows the WebCT chat rooms. Students could chat in groups in different chat rooms.

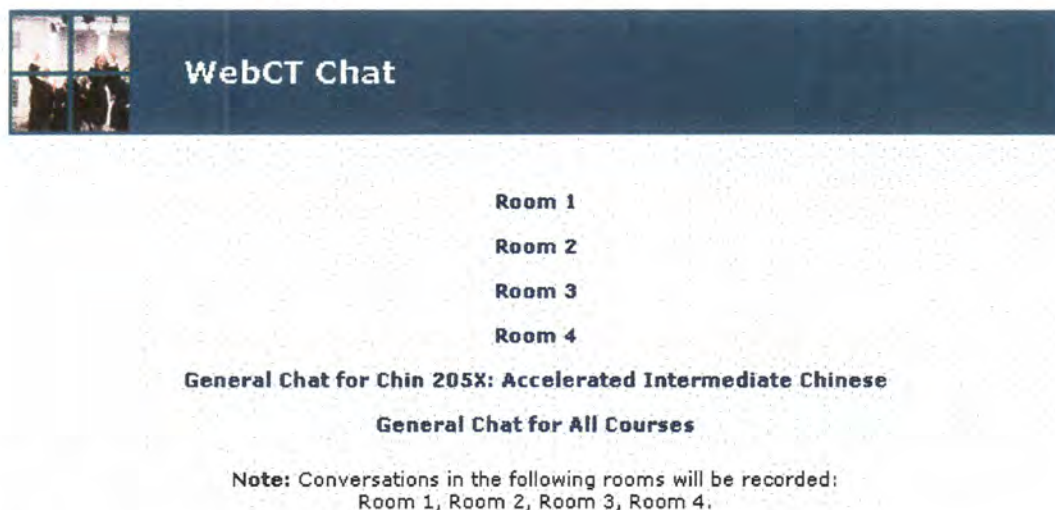


Figure 4: WebCT chat rooms

The students chatted in Chinese characters in an outside chat room provided free by a professional Chinese online chat service (<http://www.bliao.com>). Following picture is the header of the Chinese chat room and next, an excerpt from the chat log Chinese students did on December 5, 2003. The characters in the header of the chat room meant: "Welcome to the Chinese World! Please chat politely. Do not distribute any pornography, anti-government or hacker related information)." Chinese World is the name of our chat room.

欢迎光临中文天地！
请文明聊天，勿发布有关色情、反动、黑客等的违法信息。

Figure 5: the Chinese chat room—Chinese World

As shown in the following excerpt, in this Chinese chat room, the students could type Chinese characters in the colors they chose. They could choose to talk to

the whole group or ask and answer individual classmate's questions. Every student's posting was timed. The time was Beijing Time. The time helped the instructor and I assess the students' speed in responding and typing.

(03:49:23)[马]与所有人说:我不喜欢喝啤酒

(03:50:03)[马]与陈说:陈,我没有去过新加坡

(03:50:03)胡对所有人点了点头:马,我和啤酒不是好朋友

(03:50:04)Jon与所有人说:好

(03:50:05)陈与嘉说:你现在读什么

(03:50:29)陈与柏说:你现在读什么

(03:50:30)柏与所有人说:你喜欢喝日本花酒吗?智

(03:50:41)嘉与所有人说:我听说上海是一个很好购物的城市!所以,我很想到上海走走!

(03:51:36)柏与所有人说:上海人很新潮

(03:52:03)胡对所有人点了点头:法国很好玩。

- Notes: 1. To protect the students' identities, parts of the their names were erased.
2. The colors in the chat log only indicated the students' choice of their favorite colors for the messages they typed, but contained no other special functional meanings in the chats

The excerpt translated in English as follows:

Ma (to everybody): I do not like beer.

Ma (to Chen): Chen, I have never been to Singapore.

Hu (to everybody, nodding his head): the beer and I are not good friends.

Jon (to everybody): Good.

Chen (to Jia): What are you reading now?

Chen (to Bai): What are you reading now?

Bai (to everybody): Do you like the Japanese wine, Zhi?

Jia (to everybody): I have heard that Shanghai city is a great shopping place.

So I really want to make a trip to Shanghai.

Bai (to everybody): Shanghainese are very fashionable and modern.

Hu (to everybody): France is a fun place.

The students chatted twice in the Cargill digitally-enhanced classroom and three times outside of the class in distance. According to the chat logs, when the students chatted in distance, they were in their apartments, in the library, in the Net bars, in their offices, and the language lab in the Department of Foreign Languages & Literature.

Significance of the Study

The significance of this study lies in the benefits it may bring to the professionals in the following fields:

- Chinese (Japanese, Korean) language teaching
- heritage language education
- instructional design of blended language course

Heritage language educators, especially Chinese as a foreign language teachers, should benefit from this study. The findings of the study provide insight into the use of online chats in developing language learners' skills. Especially important are the lessons learned about scaffolding the heritage learners' existing conversational skills and grammatical knowledge of the target language to provide for the development of their reading and writing skills. Furthermore, this study was done in a real classroom context. The design of the course, as well as the study, should expand language teachers' and instructional designers' knowledge base about effective integration of technology into the language classroom and the development of online language courses. Because the Japanese and Korean languages have Chinese characters, the findings of this study may shed light on the teaching of Japanese and Korean languages in terms of the writing of the characters.

Preview of the thesis

There are five chapters in this thesis. Chapter 1, **Introduction**, provides all the necessary background information, purpose, and significance of the study. The readers will get to know how my personal background and experiences led me to the study and some of the urgent and challenging issues that this study aimed to address: the effective education of heritage learners and pedagogical innovation by

investigating the use of online chat by heritage learners in a technology-rich environment. Because qualitative research is open-ended in the inquiry, reviewing the literature was an ongoing process in this study. I did look at the literature at first to locate any possible gaps in the previous research and decide which research method that might be appropriate for my study. In Chapter 2, **Literature Review**, I indicate the gaps that this study aimed to bridge in the research literature and the literature relevant to the themes which emerged from the data analysis. Further, theoretical foundations laid for this study are also introduced in chapter two. In Chapter 3, **Methodology**, I give a detailed introduction of the rationale of choosing a case study approaches for my study; the research procedures, including sampling of the participants; and the data collection and analysis steps adopted to address the research questions proposed for this study. Furthermore, I introduce my multiple roles in the research and the strategies I used to build a trusting relationship with my participants and to establish the scientific trustworthiness of this case study. Chapter 4, **Findings & Discussions**, an exciting part of the thesis, presents the themes which emerged from the data analysis. That is, I present the findings of the study and discussions about those findings. Chapter 5, **Conclusion and Implications**, will provide a conclusion of the thesis and the implications of the study on future teaching and research.

Chapter 2. Literature Review

Because qualitative research is open-ended in the inquiry, reviewing the literature in qualitative studies is an ongoing process that will continue through data collection and analysis (Gay & Airasian, 2003). In the literature review for this study, I first wanted to determine what had already been done that related to the use of online chat in language classes and where major gaps exist, if any, in the literature. In addition, I reviewed research literature related to the themes that emerged from the preliminary analysis of the data. The themes that emerged from the data analysis included the importance of social interaction in the class and the students' motivation in a technology-rich learning environment.

This chapter starts with an introduction to the theoretical foundations for this interpretative case study and is followed by a review of the research relevant to this study of online chat in a technology-rich learning environment for heritage learners of Chinese as a foreign language.

Theoretical Foundations

The theoretical foundations for this case study are scaffolding learning and situated learning. The course instructor and designer and I (co-designer of the course, and researcher) used these two theories to guide our design of this technology-integrated course in which this study was conducted; we aimed to transform the traditional teacher-centered, didactic learning environment to a more student-centered, constructivist-learning environment.

Emerging information and communication technologies, because of its interactive nature, have provided tremendous interactive opportunities to learners and teachers in the learning environments; as a result, these communication technologies have been changing language learning approaches. In Tschirner's words, "key terms such as situated learning, input, interaction, and awareness indicate how much the approach to learning foreign language has changed over the past 10-20 years" (Tschirner, 2001, p. 306). Recent years have seen a shift to favor of constructivist paradigm in foreign language education, as Ruschoff and Ritter (2001) stated, "[T]he constructivist paradigm is seen as an important methodological

basis for real innovation in foreign language learning" (p. 223). And, the core of constructivist learning is that learning is an active process in which learners construct new ideas or concepts based upon their current and past knowledge.

Therefore, I believe the scaffolding learning and situated learning theories, both are under the constructivism paradigm, are appropriate theoretical foundations for this study. These two theories are summarized below:

1. Scaffolding learning

According to Gibbons (2002), scaffolding is a temporary structure that is often put up in the process of constructing a building. As each bit of the new building is finished, the scaffolding is taken down: "The scaffolding is temporary, but essential for the successful construction of the building" (Gibbons, 2002, p.10). Scaffolding has been widely used metaphorically in education. The concept of scaffolding originated in Vygotsky's sociocultural theory (Schutt, 2003). According to Vygotsky, learning occurs in the zone of proximal development (ZPD). Vygotsky stated that thinking and problem solving could be placed into three categories. Some can be performed independently by the child. Others cannot be performed even with help. Between these two extremes are tasks the learner can perform with help from others. Those tasks are in the zone of proximal development: "What the child is able to do in collaboration today he will be able to do independently tomorrow" (Vygotsky, 1978, p. 211).

Technology has been used widely to scaffold learning. According to Lin et al. (1999), scaffolding strategies in a technology-enhanced learning environment may include process prompts (technology-based prompts or questions to help students organize, interpret, and externalize thinking), process displays (use of technology to track and reflect back to students the process they have engaged in), and process modeling (using expert processes as a model for learning).

The development of the spoken forms of language is essential for second language learners as a bridge to the development of literacy (Gibbons, 2002). For heritage learners of Chinese language, their conversational skills can be scaffoldings to the development of reading and writing skills. Online chat provides a

good opportunity to use the scaffolding. Other translation tools such as dictionaries can serve as scaffoldings in language learning. Scaffoldings can be provided by people, too. Teachers and peers can scaffold a learner to succeed in language learning.

In the Chinese language, one example of an emerging technology scaffolding is the Pinyin input method, especially for those whose native language is a European language. The Pinyin input method is a kind of Chinese word processor. By inputting on a regular computer keyboard the Romanized letters, that is, representing the sound of a Chinese character, the learner only needs to pick up the intended character from among a group of different characters with the same sound. Thus, the Pinyin input method has eliminated the necessity to reproduce Chinese characters stroke-by-stroke by hand and allows students to learn to write by building on the skills they have traditionally acquired so far more readily: the ability to speak and the ability to read. The substantial difficulties entailed in "drawing" the proper strokes that constitute a correct Chinese written character are left to the "hands" of the computer.

Thus, Chinese characters, by means of Pinyin, now have a direct relation to their phonetic characteristics. In real life communication, people use Chinese characters but not Pinyin. Therefore, the Pinyin input system is very good scaffolding.

2. Situated learning

Situated learning theory, built on constructivist philosophy, states that learning should be situated in the real-life world and occurs in authentic tasks so that learners are able apply the knowledge and skills acquired in the authentic learning environments to real-life situations. In other words, learners need to be engaged in such a way that the knowledge they construct is not inert, but rather useable in new and different situations (Jonassen et al., 1995). Situated learning theory has shed much light on language learning. As Ruschoff and Ritter (2001) point out, "research into language learning and acquisition processes suggest that mere training in structural (grammatical) and vocabulary knowledge will not result in real linguistic

competence and language proficiency” (p. 223). Language educators and researchers have realized the importance of the actual use of the target language in authentic communication. For example, Zhao (2003) claims that the language learners’ engagement in authentic communication in the target language is essential for successful language learning. Similarly, Peyton (1999) states that interaction and negotiation of meaning are crucial for language learning and language development. According to Tschirner (2001), situated learning in foreign language learning means learning the target language through the use of it in authentic situations. Situated learning was applied in the design of the Chinese language class in which this study was conducted.

Because online chat is an Internet supported interactive communicative activity, and interaction in learning is generally considered important, literature on interaction and networked communication is reviewed as follows.

Interaction and Networked Communication

Interaction in the classroom, either in traditional or distance learning, has been considered a key to success to a student’s learning, retention, and overall perceptions of the course and instructor’s effectiveness (Flottemesch, 2000). In a traditional language classroom, learners’ use of the target language is very limited. However, with the development of computer and Internet technology, local and global networks have provided limitless opportunities for learners to actively interact with the teacher, peer learners, and even native speakers of the target language. Synchronous and asynchronous modes of computer-mediated communication (CMC) are powerful tools that facilitate the creation of dynamic learning environments for language learning (Sotillo, 2000). According to Toyoda and Harrison (2002), network-based communication can increase learners’ opportunities to use the target language, induce negotiations of meaning, and improve the quality of written and spoken language. In networked-based communication, the lack of non-verbal clues (for example, facial expressions and eye contact) may facilitate negotiation of meaning because verbal correspondence is the only means of communication. Another advantage of network-based communication is that the

communication logs (email messages, chat logs) can be saved for later review by the learners and their teachers and can be used as valuable resources for both (Blake, 2000).

Online chat is synchronous (real-time), text-based, and computer mediated communication. Here we will look at the literature specifically on use of online chat in language learning.

Online Chat in Language Learning

According to Pellettieri (2000), chatting “bears a striking resemblance to oral interaction” (p.59), which has been considered to be important in second language development. Therefore, we may logically assume that language practice through network-based communication such as chatting “will reap some of the same benefits for second language development as practice through oral interaction” (p.59). Along the same lines, Beauvois (1994) implies that the conversational aspects of writing via the network have helped the students to make a certain number of expressions routine and promoted the development of automatic structures of speaking. As virtual conversation, online chat may also help students develop both writing and speaking skills. Research has demonstrated an improvement in students’ writing skills through the use of networked computers (Stepp-Greany, 2002). By using a discourse analysis methods, Toyoda and Harrison (2002) find, in a series of online chats between Japanese learners and native speakers, some language aspects are crucial for communication but have been neglected in teaching. These aspects were in the negotiations triggered by the difficulties in understanding each other even when no communicative tasks were assigned. Toyoda and Harrison sorted the negotiations into nine categories according to the causes of the difficulties: recognition of new word, misuse of word, pronunciation error, grammatical error, inappropriate segmentation, abbreviated sentence, sudden topic change, slow response, and inter-cultural communication gap. Students would not have noticed these aspects if it had not been for the opportunities to chat with native speakers online. It is, therefore, necessary and worthwhile to create online chat opportunities for language learners.

In the review of the research literature on the use of chat in language learning, I found that the research studies were almost exclusively product-oriented; that is, the data resources in studies were the recorded chat logs (e.g. Negretti, 1999; Toyada & Harrison, 2002; Tudini, 2003) and very focused on the aspects of second language acquisition and applied linguistics. For example, Sotillo (2000) investigated discourse functions and syntactic complexity in ESL learner output via computer-mediated communication. Negretti (1999) used a conversation analysis research approach and focused on overall structure of interaction, sequence organization, and turn-taking organization in the data analysis. Toyada and Harrison (2000) used discourse analysis methods and sort the negotiations in the chats into nine categories according to the causes of the difficulties: recognition of new word, misuse of word, pronunciation error, grammatical error, inappropriate segmentation, abbreviated sentence, sudden topic change, slow response, and inter-cultural communication gap.

Further, in these studies, quantitative research methods are used much more frequently in the literature (e.g. Sotillo, 2000; Tudini, 2003) than qualitative research methods. Thus there seems to be little understanding of the use of chat by the students in a language class in terms of its process and its impact on the language learning. Another gap identified in the literature review was the languages being investigated are mostly English as a foreign/second language (EFL/ESL) and European languages such as Spanish, German, and Italian. Literature dealing with the use of online chat in Chinese language classes was not found during my search.

Social Interaction and Peer Interaction in Learning

My literature review on the social and peer interaction was suggested by the emergence of some themes from the data analysis: the role of social interaction and the benefits of peer interaction in their learning.

Social interaction is important in distance and online learning. The class in which this study was conducted had an online learning environment. Three of the five online chats in this class were done at a distance, not in the face-to-face

instruction sessions. Therefore, literature on the social interaction in online and distance learning deserves examination.

As illustrated in the distance and online learning literature, social interaction is a key element in online learning (Northrup, 2001). Social interaction is necessary for the students in course setting (Vrasidas & Mclsaac, 1999), helpful to instructional interaction (Gilbert & Moore, 1998), and fosters content interaction among learners (Liaw & Huang, 2000). Research consistently indicates that increased interaction in distance courses is associated with higher achievement and student satisfaction (Zhang & Fulford, 1994; Zirkin & Sumler, 1995).

According to Zhang and Fulford (1994), Wolcott (1996), and Gilbert and Moore (1998), there is an important and complex interplay between interaction for instructional purposes and interaction based on social connections and perceptions of connections among participants. Further, when a friendly and open exchange exists among students and the instructor, a distance learning environment is likely to be more productive than an environment in which exchanges are formal and circumscribed.

Since language is a social phenomenon, language learning occurs through social interaction involving teachers and more capable peers (Tharp & Gallimore, 1988; Vygotsky, 1978; Wertsch, 1979, as in Adair-Hauck et al., 2002). Therefore, social interactions in language learning deserve a closer look when the learners/peers are provided the opportunities.

Anecdotal reports from distance and online learning professionals suggest that while threaded discussions tend to be academic and content based, online chats usually are not content based, but very social. But, in language learning especially at beginning and intermediate levels, the topics the language learners deal with are mainly about daily life, which are usually considered social in other subjects. Therefore, it is reasonable to believe that online chats may help language learners develop their target language skills.

Although there has been rich literature on the network-based interaction between learners and native speakers of a language (e.g. Iwasaki & Oliver, 2003;

Negretti, 1999; Toyada & Harrison, 2002; Tudini, 2003), little attention seems to have been given to the interaction between peer learners of a target language. The value of peer learning of languages has been under-researched (Lamy & Hassan, 2003). Salaberry (1999) has pointed out that the technology-dependent interaction among learners has been one of the most understudied aspects of computer-aided learning. This interaction, according to Salaberry (1999), should be one of the central research components for Computer Assisted Language Learning (CALL) in the years to come.

According to Van Lier (1996), there is learning value in peer exchanges on, in his words, “contingent” topics, issues arising spontaneously in conversation, and out of the participants’ own interest. His claim is echoed by Williams (2001). The latter suggests that peer-interaction assists “noticing” (attention to the form). Furthermore, its affective and motivational impact helps sustain the conversations within which learners can create further learning opportunities for themselves.

The themes that emerged from the data analysis indicate that social and peer interaction is important in the students’ language learning, and, therefore, the themes are consistent with the literature.

Summary

There has been very limited research literature on networked language classrooms (Warschauer, 2000). Previous research on the use of online chat in the language class showed a strong preference for quantitative research methods. The existing literature on the use of online chat in language learning has almost exclusively focused on the issues of second language acquisition and applied linguistics. The studies seem to have failed to provide a rich picture of the process of conducting online chat especially among peers in the same beginning or intermediate language classes. As Warschauer (2000) stated, “short-term quantitative studies may fail to account for the complex interaction of social, culture, and individual factors that shape the language learning experience” (p. 41). Further, little research addresses the use of chat in the Chinese language, which has a unique separation of its sound and writing systems. A study of the use of online chat

in Chinese may provide different dimensions and pedagogical uses of online chat from studies on other European languages. Further, the use of online chat by heritage learners well deserves in-depth study because of their usually very unbalanced command of listening, speaking, reading, and writing skills.

This chapter discussed the theoretical foundations for the study and provided a literature review on the research related to this study. Scaffolding and situated learning theories are used to guide the design of the course as well as the study. The literature review has revealed several gaps which this study aims to bridge: (1) no studies on the use of online chat by heritage learners of any foreign language, (2) an obvious paucity of research literature on technology integration into the Chinese language class, (3) few studies adopting a qualitative research approach to investigate the process of online chat in language classroom, and (4) the languages studied were limited to common foreign languages such as Spanish, German, French, and English as a foreign/second language (EFL/ESL), and experiments were often short-terms (Zhao, 2003).

Therefore, a study of the use of online chat by heritage learners of Chinese is worthy of investigation and will provide useful original research to the field.

Chapter 3. Methodology

This study was an interpretative case study. A case study is a common type of qualitative study. As Gay and Airasian (2003) indicate, in qualitative research “the researcher is the research method” (p.187), because qualitative researchers usually rely heavily on verbal description; researchers are their own main instrument of data collection, interpretation, and written narratives of the data analysis and the study.

In this chapter, I will first introduce my rationale for choosing a qualitative research approach, specifically, an interpretative case study, in my inquiry; the design of the research; the research context; and the participants. In addition, procedures of data collection and analysis will be introduced. Last, my role as a participant researcher and the strategies I used to establish the scientific trustworthiness will be discussed.

Research Design and Its Rationale

This study is an interpretative case study to investigate the affordances online chat provides to heritage learners of Chinese as a foreign language in a technology-rich learning environment. The literature review outlined in the previous chapter indicates that research on the use of online chat in language learning has had a focus on the chat product. In previous studies, the chat logs were the main or only data resources of the studies, and the focus was on aspects of linguistic features of the chats. That is, the studies were very applied-linguistics and second-language-acquisition oriented. The research methods were mainly quantitative. No research was found to have investigated the use of online chat by heritage learners who usually command competent conversational skills of the target language but whose literacy skills remain undeveloped when they come to college. Therefore, the use of online chat, a form of text-based virtual conversation, by heritage learners in college deserves research.

Qualitative, interpretive research is considered useful to describe and answer questions about participants and contexts (Gay & Airasian, 2003). Qualitative inquiry enables researchers to understand a phenomenon from the participants' perspectives: the meanings people derive from a situation or understanding a

process (Merriam & associates, 2002). Qualitative research “typically involves highly detailed rich descriptions of human behaviors and opinions” (p. 1172). Professionals in the field of educational technology have called for the use of more qualitative research methods to explore training and school processes (Bosco, 1986; Clark, 1983; Savenye and Robinson, 1996). The case study is one of the typical qualitative research methods. According to Marriam et al. (2002), the case study is “an intensive description and analysis of a phenomenon or social unit” (p. 8). With a concentration upon a single phenomenon or entity (the case), the case study approach seeks to describe the phenomenon in depth. According to Yin (2003), the case study inquiry relies on multiple sources of evidence. And, Merriam et al. (2002) states that documents, interview, and observation are important data sources in qualitative research.

Yin (1989) defined a case study as an empirical inquiry that focused on understanding the dynamics of a contemporary phenomenon within its real-life context using multiple sources of evidence. An interpretative case study is an intensive description and analysis of a single instance, phenomenon, or social unit. In case studies, researchers explore a single entity or phenomenon bounded by time and activity. They collect detailed information by using a variety of data collection procedures during a sustained period of time (Merriam, 1988; Yin, 1989).

As indicated in Chapter 1, the graduate course “Action Research in Education” influenced me and prepared me for this study. Action research by its nature is very practical and educative, because the teacher-action-researcher investigates his/her own practice in new ways. The research is also very valuable because it is concerned with everyday problems in the classroom or the school, rather than theoretical problems defined by researchers within a discipline of knowledge. Action research tends to be local, specific, and oriented to a specific case (Small, 1995). The aim of action research is always practical: to lead to some kind of change or practical application. Therefore, in this sense, action research is often called applied research—“research with real-world application” (Esterberg, 2002, p.137). This study was action-oriented. I did the study in a real classroom. The instructor and I

aimed to seek pedagogical innovations generated by technology integration and effective ways to educate heritage learners.

.In this study, the use of the chat in a technology-integrated Chinese language class was framed as case. We aimed to gain an understanding of the process and affordances of the use of online chat from the perspectives of both the typical representatives of the heritage learners and the instructor of Chinese as a foreign language at the college level in the United States.

Research Context and Participants

The instructor decided to offer this experimental course because she had realized the number of heritage learners was increasing every year in the Chinese language courses, and she believed effective education of heritage learners is important. According to the instructor, who had been teaching Chinese for more than 10 years in the United States, the heritage learners were usually intimidating to the traditional learners of Chinese as a foreign language who had neither previous Chinese learning experience nor family background. Moreover, instructors have difficulty knowing precisely what heritage learners already knew and what they want to learn. A mixed class with heritage and traditional learners of Chinese is challenging and frustrating to both the instructor and the students. By offering this experimental course to only heritage learners, the instructor hoped to get a good idea of the learning needs and proficiency levels of heritage learners at advanced beginning and intermediate level and, therefore, educate them more effectively.

This class was taught in a blended learning way, that is, WebCT, plus an outside Chinese chat room, were used to support an online learning environment, and the conventional face-to-face instruction took place in a digitally enhanced classroom. We decided to add this online environment because it “allows interaction that is text-based, many-to-many, and time- and place-dependent” (Warschauer, 1999)

There were 12 students from seven countries in this class. Nine of them were heritage learners at different Chinese language proficiency levels. The context (a Chinese language class consisting mainly of heritage learners) and the length of the

time (end of August to middle of December, the whole fall semester of 2003) offered good opportunities for a very close look at the use of online chat by the heritage learners learning Chinese.

Decisions about the sampling of the participants in the study were very carefully made after I got to know all the students in the class well enough to make the choice of the participants. Based on the typology strategies in qualitative inquiry (Kuzel, 1992; Patton, 1990; see Miles & Huberman, 1994, p. 28), I used a criterion type of sampling. That is, all the participants met some criterion, and this type of sampling is “useful for quality assurance” (Miles & Huberman, 1994, p. 28). Following are the criteria I used during my sampling process:

- First, the participants should be good representatives of the population of the heritage learners of Chinese at this university and even in the United States so that the findings of the study can make contributions to the emerging field of heritage language education in the United States and help develop the Chinese curriculum on this campus. When sampling the participants, preference was given to American Chinese students in the class because the target audience of my research report would be language educators in the United States, since the study context is an educational institute in the United States. Therefore, the study may be replicated in other U.S. institutes, which is important to the validity of the study. Further heritage learners from different countries may have had different exposure to the Chinese culture and different Chinese learning experiences in their own countries that I may not be familiar with. And these differences may have led to uncontrollable variables that may have eventually affected the reliability of the study.
- Second, preference was given to students who had never taken any Chinese language course at the college level, so that their experiences in this course might provide the truest and best possible affordances online chat could provide for a novice heritage learner of Chinese.
- Third, the participants should be representatives of very typical heritage learners at college level: they have speaking proficiency of the target

language (in this case, Mandarin Chinese) but undeveloped reading proficiency (Douglass 2001; Dumitrescu, 2000; as in Matunaga, 2003).

Based on these three criteria, four participants were chosen from the twelve students in the class: Tom, Ryan, Lyn, and Dell (all pseudonyms). Two of them were foreign born Americans: Tom (Taiwan) and Dell (China). Ryan was American born Chinese (ABC). Lyn was born in and grew up in Indonesia. She was the only international and female participant in this study. These four students were good representatives of heritage learners at this Midwest university and even in the United States. According to Tucker (1999), foreign-born immigrants consist of the fastest growing segment of the U.S. population. American born Chinese are the major target audience of the foreign language curriculum in the United States. A substantial body of heritage learners at this university are from other countries, especially Asian countries such as Malaysia and Indonesia. Please see Table 1 for the profiles of these four participants.

Before these four students enrolled in the class, none of them had taken any Chinese classes. Actually, they originally registered for Chinese 101, the beginning level class, but transferred to the experimental class in the first week of the semester after they heard about the new course for heritage learners. Their Chinese proficiency levels were true demonstrations of the various levels of the heritage learners' when they come to a Chinese language class at college. These four participants all could communicate orally in Mandarin Chinese, although some were a little better than the others. Their literacy levels varied. Ryan and Dell could not read or write in Chinese. When assessed by the instructor at the beginning of the semester, Lyn could recognize very limited Chinese characters in a beginning level textbook. Tom possessed a relatively high literacy level in Chinese language. He went to second grade in Taiwan before immigrating to the United States with his parents when he was almost 8 years old. Tom learned the traditional Chinese characters and a different set of pinyin (sound system) symbols in Taiwan. But, as in his own words in the interview, he "forgot most of the Chinese characters learned in Taiwan," because he "almost never used them in the United States. In this class, we

taught a simplified version of the Chinese characters and the Pinyin symbols used in Mainland China. Therefore, the Pinyin system and the writing system taught in this class was new knowledge to all these 4 learners. Please see Table 1 for the profiles of the participants, including their previous Chinese language learning experiences and the Chinese proficiency levels before taking the course.

Table 1 summarizes the demographic and related information about the 4 participants in the study.

Table 1. Profiles of the four participants

	Tom	Dell	Ryan	Lyn
Gender	Male	Male	Male	Female
Age	21	21	20	20
Citizenship	American (born in Taiwan, immigrated to the US. at almost 8)	American (born in P. R. China, immigrated to the U.S. at 7)	American (American born Chinese)	Indonesian (born in and grew up in Indonesia)
Previous Chinese learning experiences	Up to second grade in Taiwan	No informal or formal instruction received	No informal or formal instruction received	Two years' private tutoring
Chinese conversational skills (*)	Intermediate-High	Intermediate-Mid	Intermediate-Low	Intermediate-Low
Chinese reading and writing skill level	Read and write some traditional Chinese characters*	Almost zero	Almost zero	Read very limited simplified Chinese characters
Language(s) or dialect(s) spoken at home	Mandarin Chinese,	Mandarin Chinese	Mandarin Chinese	Chinese Fujian dialect
Languages learned	Mandarin Chinese, English	Mandarin Chinese, English, German	Mandarin Chinese, English	Indonesian, Mandarin Chinese, English,

Note:

- (1) According to these 4 participants' reports, all their parents were Chinese and spoke Mandarin Chinese at home
- (2) Tom learned the Pinyin and writing systems in Taiwan which are different from what we taught in the class.
- (3) Although neither the instructor nor I was a certified Oral Proficiency Interview (OPI) tester, we followed the American Council on Teaching of Foreign Languages (ACTFL) proficiency guidelines for the speaking skills section to rate the students' conversational skills.

Data Collection

Data collection for this study was done in the experimental Chinese class in the fall of 2003. The multiple data sources of evidence in this study were gained from documents, interviews, and observations. During my research, I kept personal reflective journals and field notes. I am not using my journals and notes as a significant source of the data, but they definitely provide insights into my interpretation of my data.

In this study, the data documents included students' reflective journals, written assignments, chat logs, and threaded discussions, all of which were available in the online environment of the class. The students' chat logs were all automatically recorded in the WebCT chat rooms and the outside Chinese chat room. In total, the students did three online chats in Chinese Pinyin in the WebCT chat rooms and two online chats in Chinese characters in a Chinese Web chat room outside WebCT. Observation was done both during the chat sessions and in the face-to-face meeting classroom.

I interviewed the 4 participants in Chinese in November 2003. Interviews were about 40 minutes long and were tape-recorded. Tapes were transcribed and translated word for word from Chinese into English. Interviewing gives the research the opportunity to more clearly glimpse what the subject is thinking (Esterberg, 2002). In my study, interviewing was more useful and powerful than I expected as a

method of data collection. The 4 participants talked in Chinese to me, although we did switch to English sometimes. The code switching was very natural and helped the interview move very smoothly. Students' relatively strong oral skills in Chinese demonstrated in the interviews were in sharp contrast to their poor literacy revealed in the online chats in Chinese Pinyin and in Chinese characters. This contrast later helped me understand students' perception of the use of online chat in the class.

The following table summarizes the data sources for this study.

Table 2: Data sources

Source of evidence	Volumes of evidence
Chat logs (automatically recorded by the chat tools)	Logs of five chats with two in Pinyin and three in Chinese characters (automatically recorded by the chat tools)
Students' journals (class assignment)	Four participants' four reflective journals and one debriefing journal specifically on chat
Observations	Researcher's observation notes during face-to-face sessions and online chats
Interviews	40 minute- taped interviews each (4 total) done at a time close to the end of the semester
Interviews/ Conversations with the instructor	Notes from the interviews/conversations with the instructor
Students' summaries of the 2 nd Pinyin chat	Four participants' summaries in Chinese of the second Pinyin chat
Activities of the study	Researcher's journal

Although the research approach did not use action research, this study was action-oriented. The class and research activities were aligned with each other in many ways. Table 3 provides information about the research related class activities in this study.

Table 3: Research and related activities

Date	Major class activities	Follow-up activity (if any) and other notes
08/2003	Institutional Review Board (IRB) approved the research	Informed Consent forms were signed
08/23/2003	Fall semester started on	Class started
09/19/2003	Students' first chat in Pinyin as a whole class in a WebCT chat room	Second reflective journal due on 10/05/03
10/07/2003	Students' second chat in Pinyin in a WebCT chat room	A summary in Chinese characters of the second Pinyin chat was the major part of the midterm exam
09/30/2003	Four participants were selected	Researcher started to focus on the four participants' performances in the class
10/2003	Researcher reviewed the chat logs and journals	A strong theme emerged: Chat is a great and helpful way of learning Pinyin and character. A sub-question was raised: Why do the learners think so?
10/13/2003	Students' request for chats characters during the class discussions	Request led to interview questions: Why did the students want to chat in characters instead of Pinyin? Any differences and the relationships between chatting in Pinyin and in characters?
11/04/2003 11/05/2003	Students' first chat in characters in two groups in a Chinese chat room at a distance	Students wrote a debriefing journal specifically on this chat activity.
11/2003	Instructor and researcher's review of the chat log in Chinese characters.	The high accuracy rate of the chat log raised the interview questions: Were the learners concerned more about the accuracy than fluency in the chat? How could they produce chat of high quality in Chinese characters?
11/2003	Researcher's interviews of the 4 participants.	The researcher started to transcribe and translate the interviews.
11/2003	Researcher compared the themes.	More themes emerged.
12/04,05 /2003	Students' second chat in characters in two groups.	This was the final exam.
12/10/2003	Final reflective journals were due.	The researcher started to compare the themes across the cases.
12/10/2003.	Official departmental anonymous course evaluation.	Analyzed by the department and returned to the instructor on 01/30/04
12/12/2003	Course survey on class activities was done in class	Students did the survey anonymously.
12/2003	Researcher organized the data and the tentative explanations of the themes	Member check in English. The 4 participants were informed of the tentative themes and agreed on what they said in the quotes.
08/2003— 01/2004	Ongoing Conversations between the course designer and the instructor	Design and make decisions on the class activities, lesson plans, etc. including the use of online chats in the whole semester.
08/2003— 12/2003	Researcher/course designer observed the face-to-face class sessions and online chat sessions	Done through the semester

Data Analysis Procedures

The major procedures of the data analysis included the following steps:

1. Translating the data

Given that the final product of the research report will be in English, and a large part of the audiences will be language educators, researchers, and educational technologists who do not understand Chinese, the researcher first did word-for-word translation of the taped interviews and any others documents related to online chat. The original and translated data were shared with the instructor for a consensus opinion.

2. Data analysis

The data analysis for the case study followed the sequence of within-case analysis, cross-case pattern search, shaping hypotheses, and reaching theoretical saturation, as Eisenhardt (1989) outlined.

I used a version of grounded theory to work with my data and develop meanings (Strauss & Corbin, 1990). I went through the essentially two-stage process of coding (Esterberg, 2002).

I started the data analysis with within-case analysis by analyzing the four individual cases one by one to avoid confusion and bias against one to another. After the within-case analysis, I became familiar with each of the four embedded cases as a stand-alone entity. Next, I conducted the cross-case pattern search by comparing the results of the four individuals for similarities and differences. The exact steps of analyzing the data were as follows:

- (1) The initial state is open coding. At this stage, I worked intensively with my data, and I remained very open to whatever I saw in the data. I used multicolored highlighters to note the key phrases. Also, as I became more and more familiar with my data, very naturally I began to see patterns and commonalities.
- (2) Next is development of themes. After the open coding, I started to develop some categories for the recurring themes including: online chat is a great way of learning Chinese Pinyin and characters, online chat helped me know

more about my classmates, students' use online learning aids in chats, students wrote long written assignments, etc.

- (3) The second stage is focused coding. I went through the data focusing on the key themes which were already identified during open coding.
- (4) The following step is looking for patterns. I started to look for patterns in the data that occur again and again.
- (5) Last is comparing cases. After I identified some patterns, I compared the cases more systematically.

The process of data analysis was recursive and highly iterative. The iterations were repeated as often as necessary until reaching theoretical saturation, the point when the researcher is not discovering anything new (Eisenhardt, 1989).

The Role of the Researcher

As stated in Gay and Airasian (2003), in qualitative research, "the researcher is the research method." Similarly, Lincoln and Guba (1985) argued that in naturalistic inquiry, the researcher is the primary instrument for data collection, data analysis, and data interpretation. Only the human instrument possesses the complex characteristics required to do an interpretive study—the responsiveness, the adaptability, the holistic emphasis, the knowledge-based expansion, the opportunities for clarification and summarization, and the opportunity to explore atypical or idiosyncratic responses (Wang, 2001).

Before this thesis study, I had already collaborated with the instructor on another Chinese language class in the previous semester, although not specifically for heritage learners. However, the students used the WebCT chat rooms only to chat in Pinyin but not in Chinese characters. The use of online chat had already got the instructor and the researcher's special attention in terms of its power and limits. Therefore, I had been very familiar with the research setting, and the topic, etc.

Although I have great passion and high expectation about the power of technology in innovating foreign language curriculum and enhance the students' learning significantly, I have been fully aware of the limits of technology and the

pitfalls of technology integration in the classrooms. In this study, I kept a critical eye on the use of technology in a language classroom.

As a participant researcher, I had designed and maintained the online learning environment; furthermore, I sat in most of the face-to-face sessions in the digitally enhanced classroom in the Foreign Languages and Literatures Department. The students had considered me a part of the class and were comfortable with my presence. During the classroom meetings, I often sat in front of a computer doing my online work such as uploading the online instructional materials to WebCT for the class or taking care of the email exchanges. The students would never realize that I was taking observation field notes of their class behaviors. Further, my observations focused more on the online chats. That is, I was observing the speed, amount, and correctness of the students' responses and their interactions. The students did not know I was making field notes, although they were aware of her presence during the chats because my real name ID was shown in the chat rooms and I participated in their conversation occasionally. Therefore, I do not think the observation bothered the students and my observation notes should be reliable.

Trust-building and the IRB

Before the class started, approval was granted for this study by the Institutional Review Board (IRB) for the protection of human subjects (See Consent Form in Appendix B). At the beginning of the course, students were told that ongoing research would be conducted in the class. The special status and meaning of the course was emphasized all through the semester. The instructor explained this was (1) the first experimental Chinese language course offered, (2) the first blended (online and face-to-face) language course, and (3) the first course offered specifically for heritage learners on the campus. Frequent requests were made to the students for suggestions, concerns, and, especially, complaints to help improve the course and offer insights into further possible offering of the course. A special discussion forum titled "Suggestions & Complaints" was created in WebCT for this purpose. The value and importance of the students' opinions about their learning experiences in this class was emphasized. All these efforts were made to create a

free, open, flexible, respectful, trustful, and professional environment for optimum results of learning and research. All the students, including the 4 participants in this study, signed the Consent Forms to meet the requirement of the IRB Human Subject Research Office at this Midwest university.

I worked as a co-designer and technical support person for this class. I could tell from their greetings, and their oral and written expressions that the online learning environment was very exciting to them and they liked me and needed me in this class. The students had considered me a part of the class and were comfortable with my presence either in face-to-face meeting classroom or in the chat rooms.

Establishing Scientific Trustworthiness

As Merriam (2002) states, “what makes a good qualitative study is whether it has been systematically and ethically carried out and whether the findings are trustworthy” (p. 30). According to Merriam (2002), trustworthiness has to do with the following issues: internal validity, reliability, and external validity or generalizability. Strategies suggested by Merriam (2002) guided me in establishing the scientific trustworthiness in this study:

1. Triangulation: I used multiple data sources (documents, interviews, and observations) to confirm the emerging findings. I examined the course instructor's and designer's opinions and perceptions in addition to those of the four representatives of the heritage learners. Further, after I translated the data in Chinese to English, I gained a consensus from the instructor on the translation before my data analysis.
2. Member check. I took the tentative English interpretations of the data back to the participants from whom the original data (mostly in Chinese) were derived. They confirmed in English that the interpretations were plausible.
3. Peer review. My research process was not conducted alone. I did my data collection in the Qualitative Research Methods course. I had frequent discussions with the methods professor and fellow graduate students regarding the process of study and the congruency of emerging findings.

Further, from my proposing stage to writing up the research, I got input from my committee members, and I worked closely with my major professor.

4. Researcher's position or reflexivity. I have not hidden my critical self-reflection regarding assumptions, biases, theoretical orientation, and relationship to the study that might affect the investigation.
5. Adequate engagement in data collection: I spent adequate time (the whole semester) doing this study. I did interviews, observed the chat sessions, most of the face-to-face class meetings collecting data such that the data become "saturated."
6. Maximum variation: I purposefully sought variation or diversity in sample selection to allow for a greater range of application of the findings for consumers of my research.
7. Audit trail: In the writing of the study report, I provided a detailed account of the methods, procedures, and decision points in carrying out the study.
8. Rich, thick description: I provided as much as possible description to contextualize my study so that the readers of my research would be able to determine whether their situation matches my research context and, hence, whether findings can be transferred.

Summary

Although this interpretative case study was my first qualitative research, I tried to match the characteristics of good qualitative research as listed on page 189 in Gay and Airasian (2003):

- Researchers take a holistic stance.
- Researchers avoid making premature decisions or assumptions about the study.
- Methods focus on person-to-person interactions.
- Researchers spend a good deal of time in the research setting.
- Researchers gather data directly from the participants.
- Researchers remain open to alternative explanations of phenomena.
- Researchers admit to and describe their biases and preferences.

- Phenomena are described and explained from the viewpoint of, and in the voice of, the participants.
- Researchers are responsible for obtaining participants' informed consent and ensuring their ethical treatment throughout the study.
- The research focus is on discovery and understanding, rather than on conformation of existing theory.

As introduced above, I tried to take great care of the methodology issues necessary for a good qualitative study. In this chapter, I introduced the research context, question, the sampling process in choosing participants, the multiple data sources, the data analysis procedure, and the semester-long research time I spent in the research field. I also took care of the participants' informed consent form. Further, I explained my role as a researcher and the strategies I adopted to build a trusting relationship between with my participants and to establish the scientific trustworthiness of the study.

Chapter 4. Findings and Discussions

This interpretative case study investigated how online chats helped heritage learners with their learning of Chinese. To fully explore the affordances provided by online chat, the case study was approached from the perspectives of everyone involved in the study: four representatives of heritage learners; the instructor; and me, the co-designer, technical support person, and researcher for the class. Since it was conducted in an experimental course offered for heritage learners of Chinese at a Midwest university in the fall semester of 2003, this case study was action-oriented. Online chat, as a mode of computer-mediated communication and the text-based virtual conversation, presented promising possibilities and affordances to heritage learners in developing their reading and writing skills from their existing knowledge of Chinese grammar and vocabulary and their conversational skills.

This chapter starts with an introduction to the implementation of the technologies in the class, then presents the findings of the study in two major parts: the affordances of online chat perceived by the heritage learners, and the affordances of online chat as perceived by the course instructor and designer.

Part 1: Heritage Learners' Perception of the Affordances of Online Chat

In this class, there were twelve students who were from seven different countries, and nine of them were heritage learners of Chinese. The 4 participants in this study were representatives of heritage learners in an American college classroom: foreign born American Chinese (Tom, born in Taiwan, and Dell, born in China), American born Chinese (Ryan), and an international student (Lyn, from Indonesia). These four heritage learners had not taken any Chinese language courses at college level before. They had either received very limited formal instruction in Chinese language (Tom, up to second grade in Taiwan, Lyn, one year private tutoring at the age of 13), or even zero instruction as in the cases of Ryan and Dell. None of them had any previous exposure to the Pinyin system and simplified Chinese characters taught in this class, which are the versions used in China.

As previously stated, the major research question for this case study is: what are the affordances online chat provides to the heritage learners of Chinese? Or, how online chat helps the heritage learners with their learning of Chinese? The sub-questions included what evidences from the students' chat logs and assignments demonstrated the heritage learners' progress on learning Chinese with the use of online chat, and why the heritage learners thought online chat was a great and helpful way of learning Chinese.

Several themes emerged from the data analysis and answered the major and sub- questions that this study aimed to address:

I. Chat accelerates the Chinese learning process

First, chat in Pinyin helped the learners acquire Pinyin, which is the fundamental step in producing Chinese characters on the computer.

As introduced before, learning to write Chinese characters by hand is very time consuming and frustrating to most learners. The Chinese Pinyin input method has connected the Chinese sound system (Pinyin) and the characters which normally appear to be two different systems to the learners of the Chinese language. By inputting Romanized Pinyin symbols on the regular keyboard, the learners can get output of Chinese characters on the computer screen. Therefore, solid knowledge of Pinyin symbols is crucial in writing Chinese characters on the computer.

Our first chat in Pinyin in WebCT got unexpected enthusiasm and positive feedback from all the students, including the four learners researched in detail.

Ryan wrote in his journal that "the online chat is a great help towards my pinyin which is another major weakness I have. I felt that I have improved a lot on my pinyin on the one chat alone" (October 5, 2003, Journal 2).

Dell and Lyn, participants in my study, were the two students in this class who expressed their strong fear and frustration to the instructor and wanted to drop the course because of the overwhelming difficulty in learning Chinese Pinyin and characters in the first several weeks. However, the chat somehow saved them and encouraged them to stay in this class: "online chat has helped me a lot in learning pinyin...We should do more online chats" (October 6, 2003, Dell's Journal 2) and

"I'm somewhat more motivated to learn the pinyin now because I just realized that it is fun to type in pinyin and to get the Chinese character output in the computer" (October 5, 2003, Lyn's Journal 2).

Tom, who started the class with almost the highest literacy level among the heritage learners in the class, revealed his very weak knowledge of Pinyin several times during my class observation. I noticed that he was much slower when chatting using Pinyin than in our face-to-face conversation. During the interview, when asked about his unusually slow responses in the Pinyin chat, he said "I have a poor knowledge of Pinyin, I do not know which symbol is the right one to use" (November 15, Interview). In his journal, he mentioned that "my weakness in Chinese is the pinyin part. I thought chatting in pinyin was a great way of learning Chinese pinyin" (October 5, 2003, Tom's Journal 2).

In summary, chatting in Pinyin helped the heritage learners identify their weakness in the knowledge of Pinyin immediately. At the same time, the chats in Pinyin excited and engaged the learners, and they were determined to improve their knowledge of Pinyin and the Chinese language.

Second, Pinyin is very useful scaffolding in learning Chinese characters

Because the WebCT chat tool does not support Chinese characters, the students did the first two chats in Pinyin symbols in the WebCT chat rooms. Around the time of the midterm exam, the students requested to chat in Chinese characters instead of Pinyin. Ryan mentioned this in class that "we will ultimately communicate in Chinese characters, not Pinyin" (face-to-face meeting class on October 13, 2003). In addition, Tom indicated in the interview (November 15, 2003) that chatting in Pinyin did not help with the mastery of the four tones of the sound system of the characters.

When writing Chinese characters, the knowledge of the tones for the characters is equally important as the Pinyin symbols. A wrong tone even with the correct Pinyin symbols may still lead to the wrong characters when writing characters on the computer with the use of the Pinyin input system. In the Chinese language, most of the characters have only one sound and one tone.

In the textbooks, every character is marked with the Pinyin symbols and the tone. But the Pinyin input system on the computer only display the Pinyin symbols indicating the pronunciation of the character and the characters with the same sound. No tone is displayed on the computer. Therefore, the learners have to know the right tone for the character if he or she wants to get the right character. In other words, “the reproduction of Chinese [on a computer] requires precise character recognition; for the precise character to appear requires the accurate knowledge of Pinyin; and accurate knowledge of Pinyin requires correct pronunciation.” (Mu & Zhang, 2004, p. 4000). Thus, the learners’ solid mastery of the Pinyin is crucial in learning to write Chinese characters.

In the interviews, all the heritage learners indicated that chatting in characters was more helpful than chatting in Pinyin, but the latter was a necessary preparation step for chatting in characters.

Third, online chat significantly helped the students learn Chinese characters.

Online chats in Chinese characters provided more opportunities for the students to learn. At first, the Pinyin input system enables the learners to get exposure to more characters when they input the Pinyin symbols for a character, they would get a list of characters with the same sound and with either the same or different tones. Here is an example demonstrating a learning moment technology provides when one student made a mistake in spelling the other student’ name in one of the chats in Chinese characters.

A: 新元, 你是汉族人吗?

(Xinyuan, is your nationality Han?)

B: 我的名字不是心愿, 是鑫源.

(my name is xinyuan, not xinyuan.)

Thus, the three different characters “xin” (新, 心, 鑫) and three different “yuan” (元, 愿, 源) that the Pinyin input system generated called the students’ attention to an important feature in Chinese language—the multiplicity of homophonic characters. Very naturally, the students get the opportunity to learn

more characters. (Note: To protect the student's identity, characters in his name are replaced by other characters which also represent the multiplicity of homophonic characters). The power of the Pinyin input system as effective scaffolding is again illustrated.

Other opportunities exist when the more advanced students used new vocabulary and the lower level students got to learn them. Ryan mentioned that at the beginning of the chats, he usually had to spend much time reading the classmates' conversation carefully, usually with the help of an online dictionary: "I sometimes did not recognize the characters they used in the conversation, but when the characters were repeated again and again, I got to know them. Also I learned to use them later on in the conversation" (Ryan, interview, November 15, 2003).

The first time the instructor and I noticed the students' great progress on learning Chinese characters was in the midterm exam. The major examining task in class was to write a Chinese summary of the second chat in Pinyin with at least 50 Chinese characters. All the students in the class met this minimum requirement. To our surprise, Tom wrote a 100-character paragraph without any error. Lyn wrote 180 characters in her summary, and Dell wrote the longest summary in the class, a little more than 250 characters. In spite of the errors they made, we could understand what they wanted to convey in their writing. The evidence is summarized in Table 1, indicating the length of the students' Chinese summaries of the second Pinyin chat.

Table 4: Students' progress shown in midterm exam on October 10, 2003

Ryan	Tom	Lyn	Dell
50 characters	100 characters	180 characters	250 characters

Further, the students' confidence and eagerness in communicating in Chinese characters had grown so much that by the time of the midterm exam, they requested to chat in characters instead of Pinyin because in real communication, they would communicate in characters not in Pinyin. When writing Chinese characters, the knowledge of the tones for the characters is equally important to the pinyin symbols.

A wrong tone even with the correct pinyin symbols can still lead to the wrong character when writing characters on the computer with the use of the pinyin input system. Therefore, I applied for a free Chinese online chat room from a professional Chinese chat online services. The students' reaction to the chat in Chinese characters was fascinating. In their debriefing reflective journals, they expressed many benefits they got from the activity: recognizing more characters, reviewing the characters they had learned, typing characters faster, etc. Here are some of the quotes from my participants' debriefing journals right after the first chat in Chinese characters:

I am very satisfied with the chat in Chinese character. I feel that this chat has been very helpful to me. I found that I could type simplified Chinese characters much faster and, furthermore, I could recognize much more simplified Chinese characters. In the chat room, I have learned a lot of Chinese characters. I had never had chats in Chinese characters before, but now I sometimes have conversations in Chinese online with my friends. Chatting is really a very good way of accelerating our learning of Chinese. I can see our learning, progress, discussions and reviewing of new characters. I felt that the process of learning Chinese is really enjoyable (Tom, debriefing journal, November 15, 2003).

The other three participants in my study expressed their same excitement: "I am very happy about it (our first chat in characters) because I could use the characters I had learned to chat with my classmates...chatting in characters is more difficult than in pinyin, but it was much more interesting" (Lyn, debriefing journal, November 25, 2003). Ryan commented that "with the help of the Chinese chat room, I feel that I have made a lot more progress" (Ryan, debriefing journal, November 15, 2003). Dell mentioned that he was very nervous in the Chinese chat room at first, but later, he gained significant confidence because he found "I could read some characters. Further, my classmates could understand the characters I had written" (Dell, debriefing journal, November 14, 2003).

The high quality of the journals and the chat logs in Chinese characters--long, with relatively few errors and some new characters illustrate the power of online chat in helping students acquire Chinese characters. In the interviews I tried to dig out any possible reasons behind the high accuracy rate in the chats. I found that heritage learners were more concerned about accuracy than fluency during the chats and their relatively strong conversation skills helped them assure the accuracy. When chatting, the heritage learners used different sources to help them produce the right characters. Lyn mentioned that she used an online dictionary, and "the dictionary has been very helpful to me". RIKAI, an online website provides instant translation between Chinese Pinyin, characters, and English, was of particular interest to the students: "I used RIKAI website when I ran into characters I did not know. It is a useful secret weapon" (Dell). Ryan and Tom also told me in the interviews that they used online dictionaries, translation software, and websites:

I had to use the online dictionary frequently in the first part of the chat. When I ran into the same word and topic again and again, I knew what my classmates were talking about. Then I could join the conversation. But I still need to use the online dictionary when I want to use some new words..." (Ryan, interview, November 15, 2003).

Similarly, Dell reported that before he posted his every message to the chat room, he usually reflected, trying to make sure the sentence was correct. Dell's process was somewhat consistent with the claims in the literature content that oral skills can scaffold the development of the writing skills (Gibbson, 2002)

The great strides Tom, Dell, Lyn, and Ryan made are especially striking when viewed in comparison with other Chinese 101 students. The four participating students originally enrolled in Chinese 101, which usually meets 5 hours a week. In the study class, students only met face-to-face three hours a week. In addition, the students in the study were able to start with a textbook usually used in a Chinese 102 class. Then, in the second half of the semester, we added several lessons from a higher-level textbook for advanced beginners. As another mark of the students' dramatic progress were their written assignments. progress In the summary of an

online chat, Dell wrote 250 characters. Lyn's final reflection journal had more than 1000 characters with only a few local errors, which did not affect my understanding of her ideas. Ryan wrote his debriefing journal on the first Chinese chat with a length of more than 300 characters. Tom submitted his more than 600-character third journal almost without any error. Usually a Chinese 101 student learns 300 characters in one semester. But the participants in my study definitely surpassed their Chinese 101 peers. They attribute their accelerated learning to their online chatting experiences. As Tom expressed in his journal, "I hope the instructors can keep the chatting as a teaching and learning strategy. I believe it is a very good, effective and fast learning method" (Tom, reflective journal 4, December 11, 2003). He further remarked that "I sometimes can not believe that I can recognize some many simplified Chinese characters" (Tom, chat log dated December 4, 2003). Dell directly stated that "chatting has accelerated our learning of Chinese" (Dell, reflective journal 4, December 10, 2003).

Although the length of a writing assignment is usually not considered the only indicator of a language learners' writing ability, the length of heritage learners assignments is valid evidence of their learning progress because heritage learners have already mastered other common evaluation criteria, like grammar and vocabulary. The following table illustrates the longest writing assignment each of the four participants completed in the class.

Table 5: Lengths of the participants' reflective journals
(W for English words; C for Chinese characters)

	Ryan	Tom	Lyn	Dell
Journal 1	221 w	237 w	340 w	358 w
Journal 2	324 w	439 w	501 w	266 w
Journal 3	230 w/ 48 c	5 w/ 640 c	349 w/129c	145 c
Journal 4	341 c	343 c	251 c	2 w/ 410 c
Journal 5	93 w/ 68 c	45 w/ 779 c	9 w/ 1093 c	1 w/ 367 c

Note: Most of the English words in the journals were names of places, people and terms.

In summary, because the development of literacy skills (reading and writing) is the most important, and almost the only, learning goal of heritage learners, chatting in Pinyin and in characters was considered an effective and powerful strategy in enhancing heritage learners' acquisition of Pinyin and characters. The participants reported that chatting in Pinyin helped them acquire Pinyin symbols and was a necessary preparation step later for chatting in characters. But, they believed that chatting in characters was more helpful than chatting in Pinyin in terms learning characters because chatting in characters helped them practice Pinyin, provided opportunities to review the characters they had already learned, and assisted in learning new characters in a communicative context. Moreover, chatting in characters addressed their concern about the accuracy and, as a result, their conversation skills secured the accuracy rate they expected.

II. Chatting brings fun to the class and enhances the students' motivation and interest in learning Chinese

Online chats provided opportunities for the students to interact socially. This social interaction usually was missing in the regular face-to-face instruction sessions, which were usually filled with content-related academic activities. The students noted the following motivational benefits of the social interaction occurring in the online chats:

- "The chat activity is very good because all of us are having fun, getting to know each other more. Especially for me because I can never attend the class, and I'm curious about my classmates, so this opportunity is very wonderful" (Lyn, debriefing journal, November 25, 2003).
- "I am a person who likes to chat with people. So I really enjoy chatting with my classmates" "I do not feel I am taking a class" (Lyn, interview, November 20, 2003).
- "They are like our daily chats, very casual" (Tom, interview, November 15, 2003)

- “but in class, we may not ask these kind of questions”, “I get to know my classmates better...so I feel more comfortable in the class” (Ryan, interview, November 15, 2003).
- “in a small class, it is important for the students to know each other. Chatting helps us know each other and learn Chinese” (Dell, debriefing journal, November 14, 2003).
- “Perhaps the most interesting aspect of this course is the unique atmosphere that allows peer-to-peer interactions. I feel an active participation in learning a foreign language is most important over a plain lecture”(Dell, reflective journal 2, October 6, 2003).
- “The online chat activity was a fun part of the class. You get to know more about other people in the class while learning more about pinyin” (Tom, reflective journal 2, October 5, 2003).

Thus, online chats provided opportunities for the students to learn and practice the target language in a very casual way and in a less stressful or more comfortable learning environment. As indicated above, the students did not even feel like they were doing a class activity. These findings about the students' positive responses were consistent with the literature suggesting when there is friendly and open exchanges among students and instructor, a distance learning environment is likely to be more productive than an environment in which exchanges are formal and circumscribed (Zhang & Fulford, 1994; Wolcott, 1996; Gilbert & Moore, 1998).

The findings of this study also confirmed many of Kern's (1996) hypothesis that interaction implemented in a synchronous electronic environment in comparison to asynchronous interaction would generate more opportunities for students to participate, a greater number of language production, more time to develop and refine comments, more collaboration among interlocutors, increased motivation, and reduced anxiety. In this study, the participants did display increased motivation to learn Chinese, and little anxiety during the chats using the target language.

Further, in this class, the learners felt comfortable chatting with classmates and finding topics because they used the same textbook and possessed very similar

knowledge bases. Throughout all four chats, there was little communication breakdown. This ease of communication, both the instructor and I believe, is very important to elementary language learners. They need this kind of positive reinforcement to get comfortable with the target language and build the courage to forge on with their language learning.

Online chats indeed appeared to strengthen students' interest in continuing to learn Chinese. In his 840-character long final journal (i.e. reflective journal 4) written in Chinese, Tom stated "I will keep learning Chinese later on through the use of online chat and other online resources." Lyn expressed the same interest in her final journal: "computer, Internet, online dictionaries and resources all help me with my Chinese learning....I will not stop learning Chinese." Tom and Ryan made the decision during the fall semester to earn a minor degree in Chinese. And, Tom, Ryan and Dell took an advanced Chinese language course in the spring semester of 2004.

Online chats clearly brought fun to the class and enhanced the students' motivation and interest in learning Chinese. From their initial reaction to the first chat to the last comments on the chat, the participants kept repeating the same words: "I look forward to more chats" and "we should have more chats." The only complaint raised by the students about the use of the online chat was we did not let them chat more. This was very positive phenomenon. According to the instructor's previous teaching experiences and the literature, many learners of Chinese got so frustrated in learning Chinese and quitted after one or two semesters of learning. But the heritage learners in this class expressed their satisfaction with the class, the appreciation of the use of Internet and computers, and the further interest in learning Chinese.

In an informal, anonymous survey of the course at the end of the semester (December 12, 2003), online chat was ranked as the most helpful class activity by all the students in this class, including the participants in this study. Further, this experimental course was considered a success according to results of the official departmental evaluation of the course, which the students did anonymously on

December 10, 2003. Neither the instructor nor I was present in the classroom, as required in the course evaluation. Every item in the course evaluation received an average of 4.5 out of 5 (the highest rating).

Part 2: Course Instructor and Designer's Perceptions of the Affordances of Online Chat

As native speakers of Chinese who were educated in China for about 15 years, both the instructor and the designer were very familiar with the teacher-centered learning environment. We were both deeply influenced by the belief of being an authority in the classroom, which is the norm for Chinese classrooms.

The instructor and I worked on the designing and the instruction together. Our conversations included our reflections on the class activities, lesson plans, and further improvement. Every conversation was a semi-interview with the instructor. Our perspective from the instructor and designer point of view enhanced the objectivity of the students' responses and added credibility to the study. The data derived from the instructor and I were notes from our conversations and our lesson plans. Our data mainly was an answer to the question "what are the pedagogical uses of online chat perceived by the instructors?"

As perceived by the course instructor and designer, online chat made some valuable contributions to the course, generated pedagogical innovations, and made the instruction much more efficient. The major pedagogical uses of online chat are as follows:

1. Online chat was an effective instructional tool.

The instructor could provide timely individualized instruction to any student during online chats. This individualized instruction is very useful in the Chinese language classes, which usually consist of students with diverse proficiency levels and learning needs. Technology has been found powerful in providing effective individualized learning (e.g. Fletcher. 2003). Our findings were consistent with the literature.

2. Online chat was an effective assessment tool.

In traditional Chinese classes, quizzes and exams are usually used mainly to test students' memorization of vocabulary and grammatical rules. Students' communicative competence is much more difficult to assess. But, online chat presented itself as a very effective assessment in this class. For both the midterm and final exams, online chat was used as an assessment task. For the midterm exam, the students wrote a summary in Chinese characters of the second chat in Pinyin. For the final exam, the students did a 45-minute online chat in class.

We realized that online chat challenged students' overall knowledge of the Chinese language, including the sound system (Pinyin), writing system (characters), and grammar system because "the reproduction of Chinese [on a computer] requires precise character recognition; for the precise character to appear requires the accurate knowledge of Pinyin; and accurate knowledge of Pinyin requires correct pronunciation" (Mu & Zhang, 2004, p. 4000).. According to the instructor, "online chat is effective in assessing the students' knowledge of Pinyin, characters, and grammar, and, further, the overall communicative competence. Online chat is a stone that can kill more than 3 birds. I really like it" (Instructor, semi-interview on December 9, 2003).

As an assessment tool, online chats revealed the students' real proficiency level by displaying their ability to conduct conversations in real-life situations in terms of correctness of vocabulary and grammar rules, certain length of the conversation, and appropriateness of the responses to other conversation participants' utterances. All these elements in language learning cannot be assessed properly in traditional exams. But, in online chats all these issues could be assessed. Therefore, we think online chat is an effective assessment in the Chinese language class for not only heritage learners but also traditional learners of Chinese.

3. Online chat logs were very valuable instructional materials tailored to individual students' needs.

As indicated above, the online chat was used as an effective assessment tool. The problems and errors revealed in the chats provided very useful and valuable information to the instructor, enabling her to design lesson plans to meet the

students' specific needs and offer individualized guidance for each student. For example, one participant in my study kept making the same pattern of errors in two consecutive chats by typing the wrong characters generated by the Pinyin symbols "z." After talking with him, we found that he had a difficulty in differentiating between "zh" and "z," probably because of his early exposure to a Chinese dialect spoken by his grandma. This student did not realize it was not correct in standard Mandarin Chinese until we pointed out his errors identified in the chat logs.

To make use of the full potential for individual instruction, the instructor usually sent emails to or met in person with the students after each chat to review the errors and weakness in their language.

4. Online chat rooms were good student-centered learning environments.

The instructor and I realized the changing role of the teacher from the sage on stage to facilitator on the side in a technology-rich environment. In the students' online chats, the instructor, instead of being a subject matter authority, kept silent for most of the time during the chats, lurking and reading students' conversations. In two of the chats, the instructor and I did not participate at all. We were amazed at the smooth flow and rich content of the conversations.

The instructor and I only "jumped into" the chats when important questions remained unanswered, a thread of conversation was getting lost, students needed to be reminded of what they had learned and experienced, or we felt we should start students on a new topic. For example, in one chat, the instructor wanted the students to practice the vocabulary the students learned in a recent text titled "dining," so the instructor posted a questions to the chat room: "anybody interested in cooking? We should get together in my house and have an international dinner." Then the students started to talk about their own cooking experiences and their favorite foods. Some heritage learners are from families that own Chinese restaurants. These learners are very familiar with the Chinese names of the dishes, more familiar than what they learned in the text. Further, by using online dictionaries and the translation websites, the students used new words that were not covered in the textbook. Therefore, online chats provided very good opportunities for the

students to learn new vocabulary and practice the characters they learned. The students' abilities to initiate the conversation topics and to explore online learning aids demonstrated the power of online chats in providing learner-centered learning environments.

5. Online chat enhanced the overall quality and quantity of the course instruction.

Instead of meeting five times a week as the regular classes, this class met only three times face-to-face every week. But the instructor found that the students learned much more than those enrolled in a traditional class. One explanation could be more than one textbook used in this class, which included introduction chapters of Pinyin in Integrated Chinese (Book I, Level I), Integrated Chinese (Book I, Level II), and four lessons from Oh, China, a textbook for advanced beginners. We originally did not plan to use Oh, China, but the students' progress and demand for more learning materials led us to look for more instructional materials. Besides the textbooks, the online resource project done in the class brought a lot of student located and recommended learning resources to the class.

But a more likely explanation is the nature of the online chats. During the chats, the instructor and I did not assign specific topics to the students. By using situated learning theory as the guiding principle in designing the chat activities, we wanted to realize a three-way connection: connect the instruction of the textbook contents with the chat activities; connect the chat activities with real life situations; and use the textbook knowledge in online chats to deal with authentic problems. Therefore, the chat activities were usually carefully scheduled at a time when students had things to talk about in their real life and right after they had learned how to talk about them in Chinese. The chat logs indicated that the topics students covered included the following: their Chinese names, the countries and hometowns they are from, family members, parents' professions, favorite Chinese dishes, Chinese movies, shopping and traveling experiences, celebrating Chinese moon festival and American Thanksgiving, plans for the winter break, and knowledge about Chinese language and culture. These were all real life experiences and the

students could chat about them in Chinese. The instructor was pleased to see that the students could properly and skillfully use what they learned in authentic real-life communicative tasks. For example, in the last online chat, the students chatted about their Thanksgiving experiences and plans for Christmas. They used most of the vocabulary they learned in the last three lessons in Integrated Chinese (Book I, Level II), "Travel," "Hometown," and "At the Airport," and vocabulary they learned in previous lessons.

In summary, from the perspectives of the course instructor and designer, we identified some innovative pedagogical uses of online chats in a Chinese language class. These pedagogical innovations should lead us into further exploration of the promises that educational technology hold.

Chapter 5. Conclusions and Implications

This study identified some major affordances online chat provides to heritage learners and provided some insight into the process of online chat and its impacts on the teaching and learning of Chinese. The major contributions this study makes include the major affordances online chat provides to a class for heritage learners in following aspects: (1) online chat helped identify and address the major learning needs of heritage learners and significantly accelerates their learning of Chinese, and (2) online chat helped the course instructor and the designer achieve some pedagogical innovations.

In this chapter, I summarize the major affordances that online chats provided to the heritage learners in a Chinese language class discuss the implications for further teaching and research, and provide the limitations of the study.

Summary of the Findings

A literature review revealed a scarcity of literature on the use of online chat by heritage learners and on technology integration into Chinese as a foreign language classes. Rich research literature exists on the use of online chats in English as a second/foreign (ESL/EFL) and most of the European language classes. But, the studies mainly focused on the aspects of second language acquisition and applied linguistics; therefore, chat logs were usually the primary or only data resources and the linguistic features of the chats were analyzed by using quantitative research methods.

The major findings of the study include the following themes:

1. Online chats identified and addressed the heritage learners' learning needs very well; therefore, heritage learners' Chinese learning process was significantly accelerated.

In this study, the first two online chat in Pinyin helped the heritage learners of Chinese immediately identify their weakness in Pinyin and accelerate their acquisition of the Chinese Pinyin symbols and characters in real-life communicative tasks. Further, the order of chatting in Pinyin first and then in Chinese characters worked very well in the students' learning process. According to the heritage

learners, chatting in Pinyin was a necessary preparation step before chatting in Chinese characters. Heritage learners' existing knowledge of Chinese grammar and vocabulary in conversation proved to be valuable in their chats and the overall Chinese learning process. The Pinyin input system, the peer interaction, and the online learning aids were valuable scaffoldings in students' learning of Chinese. These findings are consistent with the literature on scaffolding learning.

2. Online chats added a dimension of social interaction to the class and helped enhance the learners' motivation and interest in learning Chinese.

Students enjoyed the casual style of online chats and felt more comfortable in the class because they had got to know each other better during the chats. The comfort and confidence students gained in chatting in the target language contributed to their enhanced motivation and interest in learning Chinese further.

3. Online chats made the instruction more efficient and generated pedagogical innovations.

The real daily life topics of the online chats were congruent with the topics and contents covered in the textbooks we used. The students got the opportunities to use and learn the target language in authentic communication. The instructor could provide timely individualized instruction to the student during chats. Further, online chats were used as an effective assessment tool for the instructor to track the students' mastery of the language, and the chat logs served as invaluable instructional materials. With the initiatives taken by the students, the whole learning transferred from a traditional teacher-centered learning environment to a more learner-centered one. This change challenged the instructor's role as an authority in the class but helped develop the students' learner autonomy, that is, their abilities to take care of their own learning.

The above findings of this study were consistent with at least two of the elements identified by Roblyer et al (1997) that result from technology-enhanced learning: motivation, and the capacity for teachers to create student-friendly materials efficiently.

Reigeluth and Garfinkle (1992) state that technology changes the teacher's role to that of facilitator. We, the instructor and the course designer, noticed and felt the change in the chat rooms. This change could be challenging and not comfortable to instructors like us who are from the Chinese culture which has elevated the status of instructors as to that of sages (Liaw and Huang, 2003).

Limitations of the Study

This study was done in an experimental class offered for the first time for heritage learners. The action-oriented quality of the study somewhat prevented me from designing the study in a more organized manner. For example, due to the technical limits of the WebCT chat tool, it does not support Chinese characters. So, I had to look for a Chinese online chat room outside WebCT when the students requested to chat in Chinese characters. As this example illustrates, I was not able to fully predict their learning needs and progress and design the chat activities accordingly. I could have scheduled more chats in a systematic way to meet the students' needs and collect more data for this study.

In addition, my position as a co-course designer and technical support person for this course might have caused me to view the use of online chat through rosy colored glasses. There might be a bias toward the positive. Another possible limit was that the students might have tended to tell me what I wanted to hear in their journals and interviews. In this class, only the final survey and the official course evaluation were done anonymously, although all the students, including the 4 participants in the study, scored online chat as "the most helpful" in the final survey and offered very positive overall comments on the official department course evaluation.

Finally, the study was limited by its exploratory and interpretive nature. I examined participants in a very specific setting. Therefore, the research findings might only be generalizable to similar courses with similar participants.

Implications for Further Teaching and Research

This study enabled me to identify the combination of personal, social, and educational elements in online chats that contribute to an effective learning environment for both the instructor and the students. The social elements of the online chats in a language class may deserve further investigation for possible improvement of foreign/second language instruction. To fully explore the promises online chat holds for language learners, especially heritage learners, future research should use larger sample of participants at different levels (beginning, intermediate and advanced) and in different settings. Further, the changing role of the instructor from an authority to a facilitator in technology enhanced environment may deserve much attention from teacher educators and teachers. From this study, the instructor and I saw a possible tension between the instructor from very teacher-centered educational background and students from a culture valuing learner autonomy which specifically fits into the American culture. Therefore, teachers and teacher educators should get prepared for the change.

Conclusion

This case study investigated the affordances online chat provides to heritage learners in a blended Chinese as a foreign language course at college level. Online chat was perceived by the instructor and course designers and the heritage learners as a very powerful tool in accelerating the instructional and learning process.

The findings of the study should be considered in the light of the study's limitations, the size of the participants, and the specific setting. However, the findings do give us important insight on the effective education of heritage learners, which has been an increasingly important issue in the field of foreign language education in the United States. Furthermore, the findings call attention to effective design of technology-integrated language learning environment and effective evaluation of technological interventions. The information gained in this study should benefit teachers and students of foreign language learners and course designers. Lastly, the changing role of the instructor to a facilitator in a technology rich environment should provide insight into any teacher education program in the 21st century

Appendix A: Glossary of Terms

Blended learning: According to Thorne (2003), the concept of blended learning “blends online learning with more traditional methods of learning and development.” Several advantages of blended learning are listed by Thorne (2003): “it suggests an elegant solution to the challenges of tailoring learning and development to the needs of individuals. It represents an opportunity to integrate the innovative and technological advances offered by online learning with the interaction and participation offered in the best of traditional learning” (p. 2).

Heritage language learners: From the perspective of U.S. language educators, heritage languages are associated with an endangered indigenous or immigrant language. In the United States, a heritage learner “is raised in a home where a non-English language is spoken” and “speaks or at least understands the language and who is to some degree bilingual in the language and in English” (Valdes, 2001, p. 38, cited in Kondo-Brown, 2003, p. 2).

Negotiation of meaning: The process in which, in an effort to communicate, learners and competent speakers provide and interpret signals of their own and their interlocutors perceived comprehension, thus provoking adjustments to linguistic form, conversational structure, message content, or all three, until an acceptable level of understanding is achieved (Long, 1996, p. 418).

Online Chat: A chat system is a synchronous (real-time) text-based computer mediated communication (CMC) and virtual conversation.

Pinyin: The Chinese sound/phonetics system. Pinyin symbols are Romanized letters, but they do not necessarily have the same pronunciations as the letters.

Pinyin input method: To allow the input of Chinese using standard keyboards, a variety of keyboard input methods have been designed.

Keyboard input methods can be classified in three main types: by encoding, by pronunciation, and by structure of the characters. The Pinyin input method belongs to the category of pronunciation in Chinese character keyboard inputting methods. The Pinyin input method involves inputting the Pinyin symbols of the characters on the keyboard and requires the user to select a character from a menu which uses sophisticated methods for guessing which characters the user intends based on context (<http://www.nationmaster.com/encyclopedia/Chinese-input-methods-for-computer>).

Simplified Chinese characters: One of two standard character sets used in contemporary printing text. In 1956 and in 1964 People's Republic China simplified several thousand characters to make learning Chinese less difficult. In many cases the new forms were ancient characters that had become unnecessarily complex over time. Returning to the original form meant fewer strokes that students had to memorize, and also resulted in a clearer logical structure of the characters (<http://zhongwen.com/jian.htm>).

Traditional Chinese characters: One of two standard character sets of printed contemporary Chinese written language. This form of writing is most popular in Hong Kong, Macau, Taiwan, and most overseas Chinese communities. Among Chinese people, Traditional Chinese characters are also called **Complicated Chinese characters** (繁体字/fántǐ zì) or orally **Old characters** (老字/lǎo zì) (http://en.wikipedia.org/wiki/Traditional_Chinese).

WebCT: An integrated e-learning environment that allows the development of online courses without extensive programming knowledge. It provides learning, communication, collaboration resources, management, and design tools. WebCT now is available in 14 major world languages. Thousands of institutions in over 80 countries are licensed to use WebCT. (<http://www.webct.com>).

Appendix B. Consent Form

This research mainly aims to seek pedagogical innovations in online and face-to-face blended learning environment on teaching Chinese as a foreign language at college level to intermediate or higher level learners, especially heritage learners from families in which one Chinese language is spoken. The research will be implemented in Chinese 205x: Accelerated Intermediate Chinese, an experimental course first offered in fall of 2003 and specifically designed for heritage learners.

Students enrolled in Chinese 205x and instructor, instructional designer and teaching assistant automatically become subjects of the research. However, participatory is voluntary; requests to be left out of the research will be respected.

The class will meet three times a week in the Cargill digitally-enhanced classroom at the Foreign Languages & Literatures Department. WebCT will be used to deliver the online part of the course. Subjects will not be exposed to any physical, mental or emotional risk whatsoever. Students will be requested to fill out a survey one at the end of the course. Students also may be interviewed for up to 45 minutes the maximum. Data for the research will comprise of records of online class discussions, chat logs, student reflective journals, and individual and group project presentation. Results of the findings will be disseminated to the public through conference presentations and journal publications. Your consent allows us to use the findings of the research along with the quotes from the discussion and chat logs for furthering our research work undertaken with or without the support of the University.

Your participation in the study will in no way affect your course grade. Your name will be kept anonymous in all the reports and articles resulting from the study. Participants' names will be replaced by pseudonyms.

You are encouraged to ask questions at any time during this study. For further information about the study, please contact me at Dr. XXX at # (telephone number) or @ (email) or me # (telephone number) or @ (email). If you have any questions about the right of research subjects or research-related inquiry, please contact the Human Subject Research Office, at # (telephone number) or @ (email), or the

Research Compliance Officer, Office of Research Compliance, # (telephone number) or @ (email).

I understand that any publication or distribution of my work by the University is a public service, and that I will receive no compensation for the use of my materials. I understand that the university will retain copyright ownership of the materials. I also understand that my materials will be altered or adapted in the development of further educational materials; and I am happy to contribute to the development of education.

I HAVE READ THE FORGOING AUTHORIZATION, UNDERSTAND ITS TERMS AND FREELY AND VOLUNTARILY SIGN THE NAME.

Signature_____

Print Name_____

Date_____

Appendix C: Sample instructions on reflection journals

(English version only)

Reflective journal 3

We expect every journal to be written (at least partially) in Chinese. Following are the guiding questions that may help you to organize your thoughts:

1. What progress you have made recently on learning Chinese?
2. Do you like writing a summary of the online chat in Chinese? Have you learned anything from this activity? Have you identified any problem/progress in your learning?
3. What do you think about the reflective journals? Are they helpful in your learning?
4. Have you found the online resources recommended by your classmates helpful? What kinds of online Chinese learning resources you want to see most?

Note: Please do not submit a list of answers to the questions. We are looking forward to well-written essay-like reflective journals.

Appendix D: Peer review of research

During the writing up of this thesis, it was given to public scrutiny and comment at the following publications and presentations:

Referred conference presentations and proceedings	Aspects of thesis
Zhang, D. & Mu, A. (2003) Use of Online Chat in a WebCT-enhanced Elementary Chinese Class, paper presentation and publication in the proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, & Higher Education, November 7-11, Phoenix, Arizona	Application of situated learning theory in the use of online chat
Mu, A. & Zhang, D. (2004) Technology Accelerates Language Learning!—Evidences from a Chinese as a Foreign Language Class for Heritage Learners, paper presentation and publication in the proceedings at annual conference of Society for Information Technology & Teacher Education (SITE) in March 1-6, Atlanta, Georgia	1. Introduction to the study context 2. Findings: learning outcomes
Zhang, D. (2004): Exploring the affordances technology provides to heritage learners of Chinese, paper presentation and publication in the proceedings at the 15 th annual conference of Society for Information Technology & Teacher Education (SITE) in March 1-6, Atlanta, Georgia	1. Literature review 2. Methodology 3. Theoretical Framework 4. Findings
Mu, A. & Zhang, D. (2004). Design and Delivery of a Blended Course for Heritage Learners of Chinese, paper presentation and publication in the proceedings at the third International Conference on Technology and Chinese Language Teaching (TCLT3), May 27-31, Columbia University, New York	1. Introduction to the study context 2. Implementation of the technologies in the class
Zhang, D. (2004). A Case Study in a Blended Chinese Class, paper presentation and publication in the proceedings at the third International Conference on Technology and Chinese Language Teaching (TCLT3), May 27-31, Columbia University, New York	1. Literature review 2. Methodology 3. Theoretical Framework 4. Findings
Zhang, D. (2004). Use of Online Chat by Heritage Learners in a Blended Chinese Class, paper presentation and publication in the proceedings at the 20 th Annual Conference on Distance Teaching & Learning, August 4-6, University of Wisconsin, Madison	1. Literature review 2. Methodology 3. Theoretical Framework 4. Findings

References

- Adair-Hauck, B., Willingham-McLain, L., & Youngs, B. E. (2002). Evaluating the integration of technology and second language learning, *The CALICO Journal*, 17(2), 269–282
- Beauvois, M. (1994). E-talk: Attitudes and motivation in computer-assisted classroom discussion. *Computers and the Humanities*, 28 (1), 177-190
- Blake, R. (2000). Computer mediated communication: a window on L2 Spanish interlanguage, *Language Learning & Technology*, 4 (1), 120-136
- Bosco, J. (1986). An analysis of evaluations of interactive video. *Educational Technology*, 16 (5), 7-17
- Chapelle, C. A. (1999). Theory and Research: Investigation of “Authentic” Language Learning Task. In J. Egbert and E. Hanson-Smith (Eds.), *CALL Environment: Research, Practice, and Critical Issues*, 101-115. Alexandria, Virginia: TESOL Publications.
- Chi, T. R. (1996) Toward a communicative model for teaching and learning Chinese as a foreign language: exploring some new possibilities. In S. McGinnis (Ed.). *Chinese pedagogy: An emerging field*. Chinese Language Teachers Association: Monograph #2. 1-28, Columbus, Ohio: Foreign Language Publications
- Chu, M. (1996). Class Plan for Teaching Chinese as a Functional Language. In S. McGinnis (Ed). *Chinese Pedagogy: An Emerging Field*, Chinese Language Teachers Association Monograph #2, 135-158, Columbus, Ohio: Foreign Language Publications
- Clark, R. E. (1983). Reconsidering research on learning from media. *Review of Educational Research*, 53(4), 445-59
- Douglas, M. (2001). Teaching Japanese as a Heritage Language at College Level: An Individualized Curriculum and Evaluation of Its Effect. Presentation at the Teaching Japanese as a Heritage Language in Southern California Symposium, Santa Monica
- Domutescu, D. (2000). Addressing the Needs of Heritage Speakers. Presentation at

the Second Language Pedagogy Symposium, California State University, Los Angeles

- Egbert, J., Chao, C., & Hanson-Smith, E. (1999). Computer-Enhanced Language Learning Environments: An Overview. In J. Egbert and E. Hanson-Smith (Eds.), *CALL Environment: Research, Practice, and Critical Issues*, 1-13, Alexandria, Virginia: TESOL Publications
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14, 532-550
- Esterberg, K. G. (2002). *Qualitative Methods in Social Research*. McGraw Hill Press
- Flottmesch, M. (2000). Building effective interaction in distance education: A review of the literature, *Educational Technology*, 40 (3): 46-51
- Fulford, C. P. & Zhang, S. (1993) Perceptions of interaction: The Critical Predictor in distance education. *The American Journal of Distance Education*, 7 (3), 8-21
- Gay, L. P. & Airasian, P. (2003) (7th edition). *Educational Research: Competencies for Analysis and Applications*. New Jersey: Pearson Education
- Gibbons, P. (2002). *Scaffolding Language, Scaffolding Learning: Teaching Second Language Learners in the Mainstream Classroom*. Portsmouth, NH: Heinemann
- Gilbert, L., & Moore, D. R. (1998). Building interactivity into web courses: Tools for social and instructional interaction. *Educational Technology*, 38(3), 29-35.
- Iwasaki, J., & Oliver, R. (2003). Chatline interaction and negative feedback. *Australian Review of Applied Linguistics*, 17, 60-73
- Johnston, B. (1999). Theory and Research: Audience, Language Use, and Language Learning. In J. Egbert and E. Hanson-Smith (Eds.), *CALL Environment: Research, Practice, and Critical Issues*, 55—64. Alexandria, Virginia: TESOL Publications
- Jonassen, D., Davidson, M., Collins, M., Campbell, J. & Haag, B. B. (1995).

- Constructivism and Computer-mediated Communication in Distance Education, *The American Journal of Distance Education*, 9 (2), 7-27
- Kern, R. (1995). Restructuring classroom interaction with networked computers: Effects on quantity and quality and characteristics of language production. *Modern Language Journal*, 79, 457-476
- Kondo-Brown, K. (2003). Heritage Language Instruction for Post-secondary Students from Immigrant Backgrounds. *Heritage Language Education Journal*, 1. 1-25. [online]. Available at <http://www.international.ucla.edu/lrc/hlj/article.asp?parentid=3600>. Accessed March, 28, 2004.
- Kuzel, A. J. (1992). Sampling in qualitative inquiry. In B. F. Crabtree & W. L. Miller (Eds.) *Doing Qualitative Research*, 31-44, (Research Methods for Primary Care Series, Vol. 3. Newbury Park, CA: SAGE Publications
- Lamy, M. & Hassan, X. (2003). What Influences Reflective Interaction in Distance Peer Learning? Evidence from four long-term online learners of French, *Open Learning*, 18 (1), 39-59
- Lee, L. (1998). Going Beyond Classroom Learning: Acquiring Cultural Knowledge via On-Line Newspapers and Intercultural Exchanges via On-Line Chatrooms. *The CALICO Journal*, 16 (2), 101-120
- Lave, J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. New York: Cambridge University Press
- Liaw, S. & Huang, H. (2003). Exploring the WWW for Online Learning: A Perspective from Taiwan, *Educational Technology*, 43 (3), 27-32
- Lin, X., & Hmelo, C., Kinzer, C. & Secules, T. (1999). Designing technology to support reflection. *Educational Technology Research & Development*, 47 (3), 43-62
- Lincoln, Y.S., & Guba, E. G. (1985). *Naturalistic inquiry*. London: SAGE Publications.
- Long, M. (1996). The role of linguistic environment in second language

- acquisition. In W. C. Richie & T. K. Bhatia (Eds.) *Handbook of research on language acquisition, Vol. 2: second language acquisition*, 413-468. New York: Academic Press
- Merriam, S. B. et al (2002) *Qualitative Research in Practice: Examples for Discussion and Analysis*: John Wiley & Sons
- Miles, M. B. & Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook* (2nd edition), Thousands Oaks, CA: SAGE Publications
- Moore, S. J, Walton, A. R., & Lambert, R. D. (1992). *Introducing Chinese Into High Schools: The Dodge Initiative*. Washington D.C.: National Foreign Language Center,
- Mu. A. & Zhang, D. (2004). Technology accelerates language earning—Evidences from a Chinese class for heritage learners. In R. Calsen, N. Davis, J. Price, R. Weber, & D. A. Willis (Eds). *Proceedings of the 15th International (2004 Annual) Conference of Society for Information Technology & Teacher Education*, 3997-4002
- Negretti, R. (1999). Web-based activities and SLA: A conversational Analysis Research Approach, *Language Learning & Technology*, 3 (1), 75-87
- Northrup, P. (2001). A Framework for Designing Interactivity into Web-Based Instruction. *Educational Technology*, 41 (2), 31-39
- Pellettieri, J. (2000). Negotiation in cyberspace: The role of chatting in the development of grammatical competence. In M. Warschauer & R. Kern (Eds.). *Network-based language teaching: concepts and practice*, 59-86. Cambridge, England: Cambridge University Press
- Savenye W.C., & Robinson, R. S. (1996). Qualitative Research Issues and Methods. In D.H.Jonassen (Ed). *Handbook of Research for Educational Communications and Technology*. 1171-1195. New York: Simon & Schuster Macmillan,
- Stepp-Greany, J. (2002). Student Perceptions of Language learning in A Technological Environment; Implications for the New Millennium. *Language learning and Technology*, 6 (1), 165-180

- Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: SAGE Publications
- Paulsen, M. F., & Rekkedahl, T. (1988). Computer conferencing: A breakthrough in distance learning or just another technological gadget? In D. Stewart & J. S. Daniel (Eds.) *Developing distance education*, 362-364, Papers submitted to the 14th ICDE World Conference, Oslo.
- Peyton, J. K. (1999). Theory and Research: Interaction via Computers. In J. Egbert & E. Hanson-Smith (eds.), *CALL Environments: Research, Practice and Critical Issues*, 17-26, Alexandria, VA: TESOL publications
- Ruschoff, B., & Ritter, M. (2001). Technology-Enhanced Language Learning: Construction of Knowledge and Template-Based Learning in the Foreign Language Classroom, *Computer Assisted Language Learning*, 14 (3-4), 219-232
- Salabarría, R. (1999). CALL in the year 2000: Still developing the research agenda. *Language Learning and Technology*, 3 (1), 104-107
- Salabarría, R. (2001). The Use of Technology for L2 Learning and Teaching: A Retrospective. *The Modern Language Journal*, 85, i, 115-122.
- Savenye W.C., & Robinson, R. S. (1996). Qualitative Research Issues and Methods. In D. H. Jonassen (Ed). *Handbook of Research for Educational Communications and Technology*. 1171-1195, New York: Simon & Schuster Macmillan
- Schrier, L. L & Everson, M. E. (2000). From the Margins to the New Millennium: Preparing Teachers of Critical Languages. In D. W. Brickbichler & R.M. Terry (Eds.). *Reflecting on the Past to Shape the Future*. Illinois: National Textbook Company, Inc.
- Schutt, M. (2003). Scaffolding for Online Learning Environments: Instructional Design Strategies that Provide Online Learner Support. *Educational Technology*, 43 (6), 28—35
- Sotillo, S. M. (2000). Discourse functions and syntactic complexity in

- synchronous and asynchronous communication. *Language Learning and Technology*, 4(1), 82-119.
- Stepp-Greany, J. (2002). Student Perceptions of Language learning in A Technological Environment; Implications for the New Millennium. *Language Learning and Technology*, 6 (1), 165-180
- Thorne, K. (2003) *Blended Learning*. London and Sterling, VA: Kogan Page
- Toyoda, E., and Harrison, R. (2002). Categorization of Text Chat Communication Between Learners and Native Speakers of Japanese. *Language Learning and Technology*, 6 (1), 82-99
- Tschirner, E. (2001). Language Acquisition in the Classroom: The Role of Digital Video. *Computer Assisted Language Learning*, 14 (3-4), 305-319.
- Tucker, G. R. (1999). The Applied Linguist, School Reform, and Technology: Challenges and Opportunities for the Coming Decade. *The CALICO Journal*, 17 (2), 197-221
- Tudini, V. (2003). Using native speakers in chat. *Language Learning and Technology*, 7 (3), 141-159
- Van Lier, L. (1996). *Interaction in the language curriculum—awareness, autonomy and authenticity*. London: Longman
- Vrasidas, C., & Mclsaac, M. S. (1999). Factors influencing interaction in an online course. *The American Journal of Distance Education*, 13 (3): 22-30
- Vygotsky, L. S. 1978. *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press
- Walton, A. R. (1996). Reinventing Language Fields: The Chinese Case. In S. McGinns (Ed). *Chinese Pedagogy: An Emerging Field*, Chinese Language Teachers Association Monograph #2, 29-80, Foreign Language Publications: Columbus, Ohio
- Wang, M (2001). *The construction of shared knowledge in an Internet-based shared environment for Expeditions*. Unpublished Dissertation, University of Missouri-Columbia.
- Wang, X. (1996). *A view from Within: A Case Study of Chinese Heritage*

Community Language Schools in the United States. Washington, D.C.:
National Foreign Language Center

Warschauer, M. (1999). *Electronic literacies: language, culture and power in online education*. Mahwah, New Jersey: Lawrence Erlbaum Associates Publishers

Warschauer, M. (2000). Online learning in second language classrooms: An ethnographic study. In M. Warschauer & R. Kern (Eds.), *Network-based language teaching: Concepts and practice*, 41-58. New York: Cambridge University Press.

Williams, J. (2001). The effectiveness of spontaneous attention to form, *System*. 29 (3), 325-340

Wolcott, L. (1996). Distant, but not distanced: A learner-centered approach in distance education. *Techtrends* 41 (4): 23-27

Yin, R. (1989). *Case Study Research: Design and Methods*. Newbury Park, CA: SAGE Publications.

Yin, R. (1994). (2nd edition). *Case Study Research: Design and Methods*. Thousand Oaks, CA: SAGE Publications.

Yin., R. (2003) *Case Study Research: design and methods* (3rd edition), Thousand Oaks, CA: SAGE Publications

Zhang, S., and Fulford, C. P.(1994). Are Interaction time and psychological interactivity the same thing in the distance learning television classroom? *Educational Technology*, 34 (6), 58-64

Zhao, Y (2003), Recent Developments in Technology and Language Learning: A Literature Review and Meta-analysis, *The CALICO Journal*, 21 (1), 7-27

Zirkin, B. G., and D. E. Sumler (1995). Interactive or non-interactive? That is the question!!! An annotated bibliography. *Journal of Distance Education*, 10 (1): 95--112

Penless Chinese language learning: A computer-Assisted Approach. A project

funded by the Fund for the Improvement of Postsecondary Education (FIPSE), Department of Education, U.S.(2001—2003). Accessed July 16, 2004 from <http://www.penlesschinese.org>

Web Course Tools (WebCT) Web page. (2004). Accessed February 12, 2004, from <http://www.webct.com>

ACTFL (American Council on the Teaching of Foreign Languages) Proficiency Guidelines, Accessed April 19, 2004 from <http://www.languageTesting.com/scale.htm>

Acknowledgements

I have many people to thank for helping me with this thesis.

First of all, I want to thank my major professor, Dr. Niki Davis. Her very professional and rigorous scholarship has influenced me greatly. I can not tell how much I have learned with Dr. Davis in the online/distance and blended courses she has taught. Every class has been a great eye-opener and fascinating learning experience to me. Without her efficient modeling of the use of technology in the classes I took with her, I would not be able to design a blended course and do this study. Further, I want to thank her for her very pushy working style. I would have never worked so efficiently on my thesis without her nudges. She always worked hard on my thesis over the weekends. Many Monday mornings were nervous and exciting moments for me when I picked up the drafts of my thesis chapters from her office full of her comments.

Second, I want to thank Dr. Aili Mu, Director of Chinese Studies at Iowa State University. Her open and positive attitude toward technology integration and her eagerness to seek pedagogical innovation has been very impressive. My collaboration with her has been very fruitful, exciting, and rewarding. She has opened a new door to me, which shows me the possibility and direction of combining my two areas of graduate work perfectly in integrating technology into the Chinese as a foreign language curriculum. Without her generous and enduring support, I would not be able to do this exciting study nor do it so joyfully.

Next, I want to thank my committee members. Dr. Marcia Rosenbusch has given me unexpected encouragement and support on my thesis study and graduate work. To be frank, without her suggestion and encouragement, I would not have done this thesis study. Her words, "you are hitting all the hot buttons in foreign language education in the U.S.," led me directly and happily into this thesis project. Furthermore, I really appreciate her invitation to join her on a presentation on the power of online chat in her foreign language education methods course and my Chinese language course at 2004 ACTFL (American Council on Teaching of Foreign

Languages) annual conference in November, 2004 in Chicago. I am very happy that I can share my work with colleagues in the field of foreign language teaching in the United States. Dr. Barbara Schwarte has served on my two master's degree committees, offering me her support whenever I need it.

Another professor deserves my thanks is Dr. Debora Kilgore, with whom I took Research & Evaluation 580: Qualitative Research Methods in fall of 2003. I learned a whole lot about qualitative research in the class. Under her guidance, I collected my data collection and did a lot part of the data analysis work. Her insightful and thoughtful comments were very valuable.

Furthermore, the students in the class in which I did my study deserve my deep gratitude, especially the four participants in the study. No matter what their citizenship is, the same Chinese root we share has been so touching and strong. I really enjoyed working with them.

Ms. Breehan Gerleman, has helped me make this thesis look better.

Lastly, I want to thank my husband and little daughter. The importance of their support is beyond description. I am happily dedicating my thesis to my dear daughter.