GuShi:

An Innovative Multimedia Program Implementing Traditional Textbook Methods for Teaching Intermediate Second Language Learners

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Abstract

GuShi is an innovative, interactive program with content based on *Chinese Language and Culture: An Intermediate Reader*, co-written by Weijia Huang and Qun Ao. A unique approach is taken to enable intermediate second language learners to practice communication skills outside of the classroom. This paper discusses the design and implementation of GuShi. The program makes use of audio recordings, animations and text in a series of learning modes that culminate with the creation of original stories. This paper also discusses how GuShi addresses a number of issues in Second Language Education, and how the program may be evaluated.

1. Introduction

Professor Weijia Huang, Visiting Lecturer of East Asian Studies at Brown University, recently co-published (with Qun Ao) the textbook, *Chinese Language and Culture: An Intermediate Reader.* This textbook is required for his intermediate Chinese class. Integrating cultural insights into a language text, the textbook aims to stimulate a student's interest in subjects related to the Chinese culture and to the student's personal life. GuShi¹, a companion to the textbook, presents a great opportunity to work on a project that combines both my artistic and technical skills along with my interest in the Chinese culture and language. The motivation for building GuShi stems from the desire to combine multidisciplinary interests in art, computers and the Chinese culture and language.

This project addresses several problems in Second Language Education and the question of how technology can assist students in learning a foreign language.

Students are discouraged from practicing their communication skills (e.g. listening, reading, speaking and writing skills) and study new

¹ Pinyin for the word "story" in Mandarin

material after class. They are no longer under the supervision of their professor, and there is less opportunity to interact with other students in the foreign language. Speaking skills, for example, will be difficult to practice without the immediate presence of the professor. GuShi aims to provide a means for intermediate second language learners in Mandarin to practice communication skills outside of the classroom. Providing a structural framework for independent study after class, GuShi motivates students to be creative and resourceful with their limited vocabulary to tell an original story.

Professors need to spend more time on creative, unrehearsed exercises like class skits, and less time on drills that emphasize memorization. Many of them still devote the instruction time to giving dictations and having students read the current chapter's text aloud. Since class time is spent on learning new material, students are not as motivated to study outside of class. Professors cannot explore creative exercises that apply the new skills when students come to class unprepared. GuShi seeks to engage the students with the new material and encourage them to spend more time studying outside of the classroom. Increasing the amount of time to practice a second language will directly lead to greater improvement in communication skills and better preparation for class. As a result, the professor can devote more time to exercises that will benefit students most if conducted in the classroom like group skits and presentations.

It is not uncommon for intermediate level students to get discouraged by the level of difficulty of the material. In contrast to their first year - with more instruction time and the fresh excitement of learning a new language -, the second year students often lose the enthusiasm and are further frustrated by the slower rate of improvement. Therefore, GuShi's fun and interactive format will help retain a student's interest in studying the language.

GuShi is designed to offer unique features that specifically address a second-year student's need for improving communication skills and fluency outside of the classroom. The rest of this paper discusses related work in Section 2, and describes the implementation of the program in Section 3. Section 4 describes how GuShi can be evaluated and used. Section 5 presents the conclusions and describes future work.

2. Related Work

GuShi addresses some problems in second-language instruction that are discussed in research literature. This section discusses three reports that inform the project and briefly looks at how GuShi and Huang's textbook compare to other existing textbooks and their accompanying programs.

Second-language Studies and College-level Chinese-language Textbooks in the United States

Cynthia Ning, Executive Director of the Chinese Language Teachers Association, identifies several problems with the Chinese-language teaching and textbooks (January 2001-December 2004). The Chinese language is taught to improve a student's listening, reading, speaking and writing skills at the same rate. Exercises in the four different communication skills receive equal emphasis. Yet, Ning declares that aural/oral skills progress at a faster rate than reading/writing skills when learning a new language. "Chinese is arguably not particularly difficult to learn to speak and understand, but is considerably more challenging to learn to read, and even more so to learn to write" (Ning, 40). GuShi considers the difference in rate of progress and offers rigorous exercises to improve aural/oral skills.

Ning criticizes textbooks for their emphasis on memorization and task-based exercises. According to Ning, at least two generations of Chinese-language teaching since the Cold War have adhered to the approach of presenting:

vocabulary and grammar drills, generally by presenting first a text (a dialogue, narrative, report, or essay: in the lower levels these tend to be teacher-made concoctions tightly controlled in terms of how many vocabulary items are included; at the higher levels they may be extracts from the Chinese press), followed by a vocabulary list, followed by grammar explanations and drills (34).

GuShi offers several innovative additions, in part because of Huang's unique teaching style in the textbook, to the traditional pedagogy for teaching the Chinese language.

Textbooks are influenced primarily by the audio-lingual tradition, which focuses on memorization and drills to help students produce fluent, flawless sentences. The audio-lingual tradition teaches students key sentence structures and engages them in extensive patterned practice. It is expected that students will internalize enough of the distinctive features of the language to become fluent in speaking it. Ning believes that textbooks need to change this approach to teaching a second language and take away the emphasis on rote memorization. The exercises in GuShi use audio recordings and animations to encourage students to create their own original sentences.

Cognitive Load in Reading a Foreign Language Text with Multimedia Aids

The Plass et al. (2002) study shows that there are limits to the effectiveness of audio and visual aids when teaching a concept. Based on the "generative theory of multimedia", multimedia aids allow one to make a mental connection between the pictorial representation and verbal representation of the concept. When there are too many representations, however, the multimedia aids hinder the learning process. A person has limited working memory and can only process a finite amount of information. Also known as the cognitive load theory, there are limits to the amount of mental activity that can be imposed on the working memory at an instance of time.

The Plass et al. (1998) study extends the generative theory of multimedia learning to second-language learning². The mind connects a visual and verbal representation when presented individual vocabulary words or the overall text. This extension is helpful when designing the user interface since too much representation of information in second-language learning can hinder learning. Instead of presenting a fixed user interface, students should have the option of selecting the mode to study the material. Possible modes may be visual, verbal or both. The key is to allow students to customize the interface so that the program suits their learning styles³.

Talking, Creating: Interactional Language, Creativity, and Context

Ronald Carter and Michael McCarthy investigate the range of social contexts to use language in a creative manner, such as story-telling, and discuss the applications of such creativity in language learning and teaching. Often times language teaching is "notational-functional and task-based" (Carter, 81). Students may learn to negate or change the tense of a sentence, but they most likely will not improve their fluency in the language by learning this way. Carter and McCarthy call for more creative approaches to teaching a language. The traditional teaching of the Chinese language needs to shift focus from the grammar exercises to creative activities that make the learning process more interactive.

Other Textbooks and their Accompanying Programs

The remainder of this section will discuss how Huang's textbook and GuShi compare to other textbooks and their accompanying programs. The selections for this discussion are used in the beginning, intermediate and advanced levels at Brown University. The accompanying programs are either used at the university or found online.

Like many other college-level Chinese textbooks, the ones used in beginning and intermediate levels follow the audio-lingual tradition. First-year students use Beijing Cultural and Language University's *Practical Chinese Reader I & II*, edited by Teng, Shou-hsin and secondyear students use Yuehua Liu, et al, *Integrated Chinese Level II*, *Textbook* – both of which come with audio cassettes that feature a native speaker reading the text from the books. There is, however, a program from another company that is an interactive supplement to *Practical Chinese Reader I & II*. The program, *CyberChinese*, includes video dialogs, shows the stroke order of new vocabulary, and features sentence scramble exercise (www.liwin.com/). While students using the program can benefit from improved reading comprehension and grammatical structure, *CyberChinese* does not feature drills to improve fluency and speaking skills.

Prior to 2003, the advanced level course also used audio-lingual based textbooks. Now students use *China Scene: An Advanced Chinese Multimedia Course*, created by De Bao Xu and Hong Gang Jin. Audio

² see Plass, 223

³ see Plass, 239

and video cassettes supplement this textbook to provide authentic broadcast media reports from China (www.hamilton.edu). The textbook, however, does not include any interactive program to further improve communication skills.

When looking at existing programs that are not based on textbooks, GuShi offers a more effective method for practicing Mandarin outside of the classroom. Interactive multimedia programs in the market offer common features like clickable characters to reveal the English translation or play corresponding pronunciation. Interactive Chinese is one of the various programs claiming that such features will teach students to write smoothly and speak fluently (www.abc-chinese.com). Although these built features provide an engaging and interactive environment for students to learn the language, especially beginners, they do not necessarily improve an intermediate-level student's fluency. Students will become familiar with the text in the program, but there are no other exercises to let them apply new knowledge. There are also other programs that combine new approaches with traditional language instruction using writing drills, flashcards and listening comprehension. For example, DrDo Chinese Multimedia Language offers games to reinforce the new skills, which may be a great way for children to learn Mandarin (www.drdo.info). These games, however, still present a problem for students who are trying to improve their fluency since the games do not require continuous dialogue or conversation.

The studies and programs discussed in this section address challenges closely related to this project and influence the design of GuShi. However, this program presents a unique solution to the problem. GuShi implements a specific textbook method that teaches the Chinese culture and language in a manner consistent with the Huang's teaching style.

3. Implementation

The design of the simple user interface of GuShi aims at a deeper and more varied use of each lesson than is possible with Huang's text. GuShi not only presents the new material of a particular lesson, but offers further exercises that encourage students to learn the material in depth. In addition, the program offers several variations of the text to engage students at different levels of familiarity with the reading. The variations of the text differ in level of difficulty to prepare the student to create an original story using the vocabulary learned in the current lesson. The design choices made in the creation of this program are based on three factors: (1) the goals of the project; (2) inspirations from the studies and programs discussed in Section 2 and (3) personal experiences from being a student in Professor Huang's class during my sophomore year. This section will discuss each feature of GuShi, the challenges encountered in making the design choices and the rationale for making the final decision on what to implement.

Each lesson offers three main modes⁴

In GuShi, each lesson is presented in three main modes: New Vocabulary, Watch Movie and Create Story.

The rationale for presenting these modes in this order is to be consistent with the presentation of new material in both the class and textbook. Huang traditionally introduces the new vocabulary before moving on to reading the text. Finally, after students fully grasp the vocabulary and new text, they can apply their new skills in more challenging exercises such as group skits or class debates. Similarly, the first mode of the program introduces the new vocabulary, the second mode presents the text, and the third mode is a creative exercise for students to apply their new knowledge.

The color scheme and visual layout closely match that of the textbook in order to maintain consistency. Using the textbook's design in GuShi signals that the program is a companion to the textbook.

The user interface is a simple design consistent throughout the lessons so that the program is as friendly and intuitive to use as possible. It is simple enough so that students can quickly adjust to the learning environment and consistent enough so that students can use all the other lessons after learning one.

While the program may seem self-contained and function alone, the program is not meant to substitute class lecture and the textbook. Different emphasis has been placed on listening, reading, speaking and writing skills in the program. Exercises drilling certain communication skills may seem more rigorous than other exercises in communication skills. The strength of a multimedia program is that one can control the playback of an audio recording or interact with text by clicking on individual words and characters. Meanwhile, the ideal way for a student to practice speaking and writing skills is to practice in the classroom with the professor.

A vocabulary list is featured in the "New Vocabulary" mode⁵

The format of the vocabulary list in the program mirrors the format of the list in the textbook. The Chinese characters, the pinyin, speech and translation are given for each new vocabulary word.⁶

Initially this feature was not part of the design, since the list already existed in the textbook. The original intention of the program was to only build features that were unavailable in the classroom and textbook in order to be a true complement to the class.

Since students often turn back to the vocabulary list when reading the text or studying for class dictations, however, the vocabulary list became a part of the design. An advantage to including the list is that the

⁴ see Appendix A

⁵ see Appendix B

⁶ A student learns a new Chinese character by learning: (1) how to write the character in either its simplified or traditional form; (2) the pinyin, which is a system for transliterating the character into the Roman alphabet; (3) the particle of speech and (4) the translation of the character

program becomes more self-contained. Students will not have to refer to the vocabulary list in the textbook while using GuShi.

A dictation is given in the "New Vocabulary" mode⁷

With the click of a button, the audio plays back the sound of a randomly chosen vocabulary word without displaying the written Chinese character(s). Students can either replay the audio, look at the written form or play the sound of another vocabulary word. This feature simulates the dictation method that is usually used in Brown University's Chinese courses. The professor selects ten to fifteen vocabulary words and reads them aloud twice while students write them down. While dictations are usually given on a weekly basis, students constantly struggle with the preparation. They practice the night before by repeatedly writing the characters to memorize them. Yet, dictations test both writing and listening skills.

This feature of the program was implemented to better prepare students for the dictations in class.

The text is accompanied with a watercolor animation in "Movie $\mathsf{Mode}^{\prime\prime^8}$

The "Movie Mode" features an animation that uses thematic imagery and optional subtitles to tell the story from the textbook. Students can select one of three versions of the animation that best suits their level of familiarity with the text. The concept of watching a movie makes the learning experience more fun and interesting than just reading from a textbook. The images shown, such as drawings of ethnic dishes and festivities, also give a visual introduction to the Chinese culture. The dialogue presents examples of colloquial phrases, proper pronunciation and tone. When subtitles are turned on, one can practice reading, listening and speaking skills simultaneously. One can practice speaking skills by simply manipulating the video playback. A scene can be stopped in order to read aloud the subtitles. Furthermore, students learn to associate the text with images.

During the design process, a suggestion was made to make only one version of the animation, which should be in the intermediate mode. Students who were not yet familiar with the text could pause the animation and interact with the subtitles (e.g. by clicking on the new vocabulary to see translations). The option to show or hide the subtitles would let the version serve both intermediate and advanced users. Condensing "Movie Mode" to just one version would have simplified the interface. Students at different levels of familiarity with the text would all use this single version.

After much thought, however, the design was reverted back to the original one with three different versions. Starting a lesson in the intermediate level will intimidate many students. It is more encouraging and motivating to let students start at a beginner's level and then progress at an individual pace to upper levels.

⁷ see Appendix C

⁸ see Appendix D

The beginner level, *Movie Mode I*, presents still images, audio playback and interactive text⁹

In the first movie mode, students can view each image individually, accompanied by one or two sentences from the text. The audio recordings for the text feature Mainland Chinese speakers who speak at a moderately fast pace. Interactive subtitles are featured in this mode too. Highlighted in purple, new vocabulary in the subtitles can be clicked on to show the translation and pinyin. The subtitles are available in both simplified and traditional form. In addition, a progress bar is displayed on the right-side of the screen. Similar to the ones found on search engine websites, the program's progress bar includes two buttons that jump to next and previous pages. A dozen of clickable bars are sandwiched between the two larger buttons as well. A distinct bar is highlighted when viewing its corresponding image and text. Clicking on one of the bars will let students navigate to that specific portion of the movie. The rationale for the user interface design and features included in the program are discussed below. The features address listening, reading, speaking and writing skills.

The interface is simple in design to avoid overwhelming the beginner student. The material is presented in a friendly, uncluttered environment. Often students find that reading a text with new vocabulary for the first time can be quite daunting. This mode aims to encourage students to overcome the difficulty of learning the new material and build confidence in applying them. In addition, the Plass et al. study (2002) states that a program's interface should be simple and give users the option of what to display¹⁰. In GuShi, there are buttons at the bottom of the screen to show or hide the subtitles. This gives students control over how much information will be displayed on the screen. Furthermore, only one or two sentences are presented at one time in order to break apart the text into more manageable portions.

The audio playback allows students to repeatedly play the recording to become familiar with the pronunciation and also practice saying the sentence aloud with the recording.

The purpose of being able to click on the new vocabulary for its definition is to make the reading smoother and more convenient. There is a tendency for students to refer to the vocabulary list in the textbook when reading the text.

Two additional subtitles in English and pinyin are included to give more information about the reading. It is not uncommon for students to get stuck on a sentence because they do not understand the meaning or pronunciation of a character. These subtitles, which can optionally be shown or hidden, will let students read with greater ease.

GuShi offers subtitles in simplified and traditional form because both forms are taught in class. Students select which form to learn and often half of the class is divided over using simplified while the other half over using traditional form.

The reason for building the progress bar is to inform the students how far they are in the text and to allow easy navigation of the movie.

⁹ see Appendix E

¹⁰ see Plass, 221

The labels are written in Chinese to fully immerse the student in the language.

The intermediate level, Movie Mode II, plays back the animation in real-time with subtitles¹¹

The animation plays continuously and students can pause the animation to change which subtitles are displayed. This mode serves as a stepping stone from the first mode to the third mode.

The advanced level, Movie Mode III, plays back the animation with delayed subtitles or no subtitles¹²

This last movie mode lets students watch the animation with delayed subtitles or with no subtitles. In the animation with delayed subtitles, the subtitles are hidden when the speaker is talking. Once the speaker finishes the sentence, the subtitles are displayed for the same amount of time needed to say the phrase at a moderately fast pace.

The delayed subtitles provide a smoother transition between the animation in the second mode and the animation without any subtitles. Students may find a large gap in the degree of difficulty between watching an animation with subtitles and watching one without subtitles.

Students create an original story using the new vocabulary in the "Story Creation" mode¹³

Students use the lesson's new vocabulary to construct an original story that accompanies an animation without dialogue.

Originally, the animation from the movie mode was used and the audio recordings were taken out. Students would retell the story from the text in their own words. After some feedback from professors, however, GuShi was modified to include the Story Creation mode. Unlike the original design which stimulated students to memorize the text and reiterate it when retelling the story, this new feature inspires students to tell stories their limited vocabulary. Students apply their new skills and creativity when creating a new story. In addition, the program lets aural/oral skills progress independently of reading/writing skills. This mode is essentially an "unrehearsed conversation", which is a creative approach to teach the Chinese language (Ning, 54).

The vector-based images with simple outlines distinguish the animations in Story Creation mode from the watercolor animations in Movie Mode. The reason for the difference in style is to show that Story Creation mode is not an extension of Movie Mode.

"Mode I" of Story Creation presents a series of still images that provoke the student to begin brainstorming an original story to tell¹⁴

¹¹ see Appendix F ¹² see Appendix G

¹³ see Appendix H

¹⁴ see Appendix I

Five to six main still images from the animation in the Story Creation Mode are presented in this mode. Students can study the images at their own pace and draft up a story to tell. A word bank of applicable new vocabulary can be turned on to help create a richer story.

The reason for including the still images is to be consistent with theme of slowly unfolding new material to avoid overwhelming the students. This theme is echoed in Huang's teaching style, the textbook and also this program. A manageable amount of information is presented to the students. Without this mode, students may have difficulty in spontaneously creating a story to accompany the animation.

Each image is associated with a word bank that students can show or hide on the screen. This lets them control how much information to display on the interface.

"Mode II" of Story Creation allows students to tell the original story in real-time¹⁵

All of the modes in the program build up to Mode II. The previous modes prepare students to tell a new story based on the animation without dialogue.

Initially, it was debated whether or not to include recording functionality in this mode. There would be the risk that the students lack the motivation to spend time creating a story, or make the misjudgment that they were already capable of telling a story after glancing at the still images in Mode I. Ultimately, this functionality was not added for three reasons. First, if this were an assignment for class, students cannot avoid creating a story. Secondly, the foreign language classes at Brown University have a language lab for students to record themselves. Thirdly, most computers have an installed sound recorder to use.

The program offers four lessons to choose from the main menu in the program¹⁶

Although there are twenty-two lessons in the textbook, there are four lessons to choose from the main menu in the program. The decision to build four modules is an example of breadth versus depth. The rationale for going into great detail with each of the four modules is that the professor and text already exists. Instead of being a replica of the textbook, the program should add greater value when used in the classroom. Also, these four lessons are selected based on its potential to be illustrated in an animation and personal interest. They need not be consecutive lessons in the textbook since each lesson is self-contained.

4. Evaluation

An experiment may be conducted to test the effectiveness of this program by forming two student groups. Before conducting this

¹⁵ see Appendix J

¹⁶ see Appendix K

experiment, the professor will record each participating student's grades in the class and fluency in the language. Each group will contain at least four students and a minimum of two students will have different academic records. The professor will also play an important role in helping to evaluate the program. When the experiment begins, ideally during the middle of the semester, group one is the control and will only use the textbook and attend lecture. Group two will use the program in addition to using the textbook and attending class. The program will either be distributed on a CD or installed on the computers of the language lab.

Performance measurements will take place after the completion of each lesson for the rest of the semester. First, quantitative analysis will come from test scores. The average of dictation scores and exams will form the results. Secondly, qualitative analysis will come from the professor's observations and student feedback. The professor can gauge a student's level of improvement from in-class observations and comparing students from the two groups. He may ask them to read the text aloud and assess the clarity, pronunciation and ability to translate it. He may also assign both groups to use the Story Creation mode. This will show if the other modes in the program give students an advantage at preparing for an original story.

5. Conclusions and Future Work

The use of computer technology, like other forms of technology, is not a 'magic wand' that can solve all problems by just being waved. The appropriate and effective use of computers for student empowerment is more a pedagogical issue than a technical one

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GuShi addresses the problem of implementing a textbook-based teaching style. The result is a program that is interactive, complementary to the classroom and stimulating to the student. Valuable lessons can be learned from the design of this program. Since the context of this project is so specific and is aimed at an individual class and teaching style, the depth of this project is explored in great detail. This program illustrates how technology can be utilized to build interactive multimedia for second language learners to practice communication skills outside of the classroom.

Challenges faced when building the program are both technical and pedagogical. There must be a rationale for any of the functionalities to be added. There is a balance between time constraint and necessity as well. User interface design presents a challenge too. Revisions were made to find a consistent theme such as making all buttons clickable and avoiding rollovers. Building the first module is the toughest part of the project since there is no prior work to base it on. It is important to document the steps taken so that there is a blueprint for future modules. There are also considerations to further improve this program. In order of priority and available resources, the following functionalities are not in this version of the program. The addition of them, however, will make this a stronger program. First would be a voice recognition that can correct the tones. Second language learners often struggle with the four different tones of Mandarin. They would be able to improve their speaking skills if the program could detect errors in tones. Secondly, the program would devote a section to dissecting the grammar in the text. Thirdly, the lessons would not be just independent modules. There would be greater interaction and navigation among them. For example, vocabulary words from one lesson appearing in another should provide a link to the text that it originally appeared. Another way to improve this program, as with any, is to get more feedback from students.

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Appendix

Appendix A. Main Menu of Lesson 13



Appendix B. Lesson 17 Vocabulary List

神話	【故事	new vocabulary			main menu exit	
vocab	ulary				上一頁	
韓愿	养凭	Han2 Ping2		name of a person	下一頁	
好色	好色	hao4 se4		lustful		
揄	抢	qiang3	v.	take away by force		
商獻	禽兽	qin2shou4	n.	birds and beasts		
增蛋	坏蛋	husi4dan4	n.	wicked person		
₽	±ł	leng1	m.	measure word for letters		
上帝	上吊	shang4 diao4		hang oneself		
高畫	高台	gao1tai2		high platform		
躍死	临死	lin2si3		an one's deathbed		
留下	留下	llu2xia4	V.	leave		

Appendix C. Lesson 15 Dictation

15. 節	日的食品	new voo	abulary	main menu	6xil
			生存		
			生存 sheng1cun2 v. survive; live		
	Play C	Character	Show Character	Next Character	

Appendix D. Lesson 11 Movie Mode



Appendix E. Lesson 15 Movie Mode I





Appendix F. Lesson 11 Movie Mode II

Pause Show Simplified HideEnglish Hide Pinyin

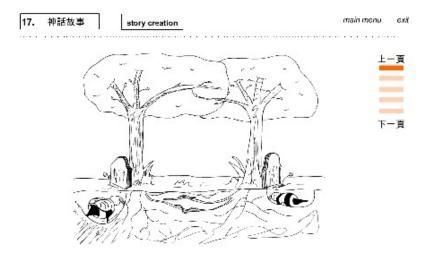
Appendix G. Lesson 17 Movie Mode III





Appendix H. Lesson 13 Story Creation Mode

Appendix I. Lesson 17 Story Creation I



Show Word Bank

15. 節日約食品 story creation main monu exit

Appendix J. Lesson 15 Story Creation II

Stop Movie

Appendix K. Main Menu of Program



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