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L1 and L2 online reading strategy usage of advanced Chinese learners
(高级汉语学习者之母语与外语线上阅读策略使用)

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Abstract: This study examined and compared online reading strategies of advanced CFL learners (N=17) in English and Chinese using data from Online Survey of Reading Strategies (OSORS), think-aloud protocols, and follow-up interviews (Oxford & Crookall, 1989). Online reading strategies have three main categories: Global Reading Strategies (GRS), Problem Solving Strategies (PSS), and Support Reading Strategies (SRS). The results showed that participants used PSS more frequently than GRS and SRS. In addition, participants' use of GRS had significantly more than SRS in English. Their use of SRS in Chinese had significantly more than in English. Furthermore, among the PRS, participants distinguished between fact and opinion, and looked for both sides of an issue significantly more in English. Among the SRS, participants printed out a hard copy and underlined information, and used reference materials significantly more in Chinese contexts than in English contexts. The data from think-aloud protocols and interviews reinforced OSORS results.

摘要: 本研究探讨十七名高级汉语学习者的线上汉语与英语的阅读策略使用。本研究的研究方法为线上阅读策略使用问卷、有声思维法和访谈方式。线上阅读策略分为三大类: 全盘阅读策略、问题解决策略及辅助策略。研究结果显示受试者使用问题解决策略的频率比全盘阅读策略及辅助策略的频率高。此外, 受试者的汉语辅助策略使用频率多于英语辅助策略使用。此三大类阅读策略在汉语与英语的使用情境下也将详细探讨。

Keywords: Online Reading Strategies, Global Strategies, Problem Solving Strategies, Support Strategies

关键词: 线上阅读策略，全盘策略，问题解决策略，辅助策略

1. Introduction

With the rapid development of technology, the internet has tended to be easier to obtain, allowing people to communicate regardless of the time and place. According to Uso-Juan & Ruiz-Madrid (2009), online reading has become an issue for discussion in the educational field and more particularly in English as a second or foreign language. While some studies have focused on online reading in English and other languages (Anderson, 2003; Tanyeli, 2008; Uso-Juan & Ruiz-Madrid, 2009), there are relatively fewer studies on Chinese online reading comprehension. Specifically, the online reading process of CFL (learning Chinese as a foreign language) readers is an important unexplored area in online reading research.

Due to the different structures of the logographic and alphabetic language system, there is a debate on the similarities and differences between reading English and Chinese. Chinese characters are composed of morphemes, while alphabetic words are composed of phonemes. Researchers have different perspectives on phonological awareness when readers decode English and Chinese words (Lau & Chan, 2003). Owing to the differences between English and Chinese linguistic structure, there may be limitations and differences between the way students read English and Chinese online. In addition, previous studies (Anderson 2003; Uzunboylu, 2005; Tanyeli, 2008) indicate that online English reading has positive effects on readers' learning motivation, academic achievement and reading skills, we wonder if these results will be applied to CFL learners. Therefore, the research questions of the current study are as follows:

a. What online reading strategies do CFL learners use in learning Chinese?
b. What are the differences of online reading strategies that CFL learners use in L1 and L2?

Exploring the presence of strategies use on online Chinese reading comprehension will enrich our understanding of the reading process of CFL readers. Addressing these questions also help teachers for developing new approaches in online reading instruction.

2. Literature review

2.1 Positive effects of online reading

Due to the multiple visual and audio functions in the online learning environment, online learning has increasingly become popular for teachers and learners. There are more and more texts such as online newspapers, journals, and magazines now processed on screen. Thus, EFL learners' use of strategies in printed text and online reading contexts was analyzed by Uso-Juan & Ruiz-Madrid's (2009) study. The study examined the effect of the online text on EFL learners' reading comprehension and their use of online reading strategies. Results of this study revealed that learners who read on screen employed more reading strategies than learners who read in printed text. In addition, 68%

of students stated that the online links are helpful for them to achieve better text comprehension purposes, because online links are organized in a semantic network in which numerous related passages are connected by keyword links. Results of this study might be used to compare the EFL learners and the CFL learners, who are the participants in our study.

2.2 Assessment

Mokhtari and Sheorey (2002) adopted a Survey of Reading Strategies (SORS) which was intended to measure adolescent and adult ESL students' metacognitive awareness and perceived use of reading strategies while reading academic materials. This SORS included three main types of strategies, that is, Global Reading Strategies (GRS), Problem Solving Strategies (PSS), and Support Reading Strategies (SRS). GRS are those intentional, carefully planned techniques by which learners monitor or manage their reading, such as having a purpose in mind, previewing the text as to its length and organization or using typographical aids and tables and figures. PSS are the actions and procedures that readers use while working directly with the text, such as adjusting the speed of reading when the material becomes difficult, guessing the meaning of unknown words and rereading the text to improve comprehension. SRS are the basic support mechanisms intended to aid the reader in comprehending the text such as using a dictionary, taking notes, underlying or highlighting textual information.

Many follow-up studies (Anderson, 2003; Pookcharoen, 2009) then used SORS to adapt Online Survey of Reading Strategies (OSORS) to examine their ESL and EFL students' different use of metacognitive online reading strategies. Anderson (2003) analyzed the ESL/EFL learners' mental process while reading an online text in order to provide learners better training in online reading tasks. He investigated different types of online reading strategies used by second language learners. Particularly, he observed the differences between ESL and EFL learners in their choice of reading strategies. The OSORS were conducted after participants were engaged in numerous online reading tasks. Results of this study reported that ESL and EFL learners demonstrated no differences in the use of GRS and SRS. The study did find, however, that EFL learners were more frequently used PSS during the online reading process. The study concluded that the similarities between the ESL and EFL learners were due to EFL learners had opportunities to be exposed to English through various media such as internet, television and radio. However, no studies so far have investigated other language learners' online reading strategies through this survey. Therefore, this study will expand its current use to Chinese reading strategies.

Tercanlioglu (2004) investigated the English reading strategies of 11 postgraduate EFL students and 6 native English speaking British students. According to the result of SORS and interview in the study, both EFL students and L1 English native speakers showed a clear preference for PSS, followed by GRS and SRS. However, L1 students reported high and frequent use of GRS while ESL students reported more frequent use of SRS.

Besides OSORS, introspective think aloud protocol is also a commonly method used in conducting language learning research. Using think aloud protocol not only allows readers to describe what they are thinking during their reading process, but also enables them to explain how they use strategies (Oxford & Crookall, 1989). Although think aloud protocol provides a direct view of readers' mental activity, there are some limitations of using it. For instance, Block (1986) stated that it is informative about the reading processes when readers have problems understanding what they are reading; however, the processes are not easily verbalized, which may not be readily studied. Therefore, in addition to think aloud protocol, conducting oral interviews is another method for readers to retrospectively report what and how reading strategies they use during their reading process (Oxford & Crookall, 1989). The method of oral interview can further supplement the results of think aloud protocols.

3. Methods

3.1 Participants

The participants are 17 advanced Chinese learners at Indiana University. All of them have learned Chinese for three years in the US and have been to China during summer vacation. They will also have to study or do internship in Mainland China after their 4 year college education. Their Oral Proficiency Interview, Chinese Computerized Adaptive Listening Comprehension Test and Chinese Computer Adaptive Reading Test showed that their Chinese level ranges from Advanced-Low to High.

3.2 Instrument

OSORS. Adapted OSORS, which is applicable to Chinese learners, was used to examine participants' metacognitive online reading strategies while reading academic materials in Chinese (such as textbooks, journal articles, class notes, etc.). This adapted OSORS consists of 37 items, each of which uses a 5-point Likert scale ranging from 1 ("I never or almost never do this") to 5 ("I always or almost do this"). Participants were asked to read each statement and circled the number that applies to them, indicating the frequency with which they use the reading strategy implied in the statement. Thus the higher item, the more frequent the use of the strategy concerned. The OSORS measures three broad categories of reading strategies: Global Reading Strategies (15 items), Problem Solving Strategies (12 items), and Support Strategies (10 items).

Besides, their L1 (English) online reading strategies were surveyed by using OSORS to address the initial comparison of their L1 and L2 online reading strategies. However, the participants did not do no. 35-37 on OSORS in L1 online reading strategies because these items which examine the translation use or thinking in L1 or L2 at the same time are only applicable to L2 reading (see Appendix 1for OSORS survey questions). Participants may spend 8-12 minutes to fill out the OSORS survey.

Think aloud protocol. Besides, think aloud protocols were conducted in L2 online reading to corroborate the results of OSORS. The texts for thinking aloud protocols come from Fourth Year Chinese textbook (see Appendix 2 for the reading texts), so the text material is appropriate to the participants' Chinese level. This Chinese text for think aloud protocol which is in a total of 1,200 Chinese characters comprises general written Chinese language, ancient Chinese texts and idioms, and several comprehension questions followed up the texts. The questions mainly include the main ideas of the article and ask participants' opinion about the article. Participants needed to tell the researcher what they are doing and how they are reading during the task. At the same time, the researcher can also ask questions that are related to their reading. Participants reported their reading strategies or were asked questions every 2 to 3 sentences. Participants spent 40 minutes to 1.5 hour to finish this task depending on their language proficiency.

Interview. Follow-up interviews focused on what and differences between L1 and L2 reading strategies. Participants were interviewed about how they think the criteria of good readers, their online reading strategies, and their differences of L1 and L2 online reading (see Appendix 3). The interview lasted for 30 minutes to complete.

4. Results and discussion

4.1 What online reading strategies do CFL learners use in learning Chinese?

4.1.1 Results of OSORS

As shown in Table 1, 17 participants overall reported more PSS (M=3.75) and GRS (M=3.56) than SRS (M=3.29) while reading Chinese texts. Based on Oxford and Burry-Stock's (1995) criteria of strategy frequency usage: high (mean of 3.5 or higher), medium (mean of 2.5-3.4), and low (2.4 or lower), the usages of PSS and GRS indicate the high frequency whereas the usage of SRS indicate the medium frequency.

The result is consistent with Anderson's (2003) results which indicate that EFL learners were more frequently used PSS during the online reading process. This result specifies that using PSS is the direct actions and primary procedure that both CFL and EFL readers act when they are encountering reading difficulties. Since using PSS is neither necessary to intentionally monitor their reading as GRS nor to use support mechanisms to aid their comprehension as SRS, the CFL readers logically do anything they can do in the beginning, such as adjusting the reading speed, trying to get back on track, or paying closer attention to reading before trying to find outside resources to solve any reading questions they faced.

In GRS, participants report the highest use (M=4.53) of using context clues to help them better understand what they are reading online (no. 18). The second highest use

(M=4.29) of GRS is that they think about what they already knew to help them understand what they read online (no. 3).

Table 1 OSORS Results of L2 (Chinese)

Strategy			Mean	SD
Global Reading Strategies (GRS)				
1	Having a purpose in mind		3.82	0.88
3	Using prior knowledge		4.29	0.77
4	Scrolling through text		3.35	1.32
6	Analyzing if the content fits purpose		3.82	0.73
8	Noting length and organization		3.47	1.07
12	Deciding what to read closely		3.29	1.05
14	Using tables, figures and features		3.76	1.09
16	Clicking links to other sites		2.41	0.87
18	Using context clues		4.53	0.80
21	Using typographical aids (e.g., italics)		2.89	1.65
22	Evaluating what is read		3.48	0.80
24	Checking my understanding		3.52	0.80
25	Guessing what the content is about		3.54	1.20
28	Confirming predictions		3.12	1.36
30	Scanning the text before reading		3.70	1.70
		Total	**3.56**	**0.54**
Problem Solving Strategies (PSS)				
7	Reading slowly and carefully		4.12	0.86
9	Trying to get back on track		4.24	0.56
11	Adjusting reading speed		4.24	0.75
15	Paying closer attention to reading		4.35	0.79
17	Pausing and thinking about reading		3.77	0.66
20	Visualizing information read		3.53	1.12
26	Rereading for better understanding		3.94	1.25
29	Guessing meaning of unknown words		3.76	0.97
31	Skipping difficult words or sections		2.94	1.09
32	Evaluating text before using it		3.53	1.18
33	Distinguishing fact from opinion		3.76	0.90
34	Look for sites that cover both sides of an issue		2.82	0.88
		Total	**3.75**	**0.28**
Support Reading Strategies (SRS)				
2	Taking notes while reading		2.41	1.06
5	Reading aloud when text is hard		3.53	1.12
10	Printing out a hard copy of text		3.59	1.18
13	Using reference materials		5.00	0.00
19	Paraphrasing for better understanding		3.96	0.83
23	Going back and forth in text		3.06	0.83
27	Asking myself questions		2.65	0.93
35	Translating from Chinese into English		2.88	1.22
36	Thinking in both Chinese and English		3.65	1.06
37	Seeking materials in English		3.12	1.27
		Total	**3.29**	**0.46**

In PSS, participants showed the highest use (M=4.35) in paying closer attention to what they are reading (no. 15). The second highest use (M=4.23) of PSS was that they try to get back on track when they lose concentration (no. 9) and they adjust their reading speed according to what they are reading online (no. 11). In terms of SRS, all participants

showed consistently a high mean score of 5 in using reference materials to help understand what they read (no. 13).

4.1.2 Results of think aloud protocol and interview

Global Reading Strategies. The following items of GRS are used to link with participants' OSORS results and their report during think aloud protocol and interview (see Table 2).

Table 2 L2 Global Reading Strategies

Category	No	Strategy	Mean	SD
Global Strategies	18	Using context clues	4.53	0.80
	22	Critically analyze and evaluate the information	3.48	0.80
	8	Review first by noting its characteristics like length and organization	3.47	1.07
	12	Decide what to read closely and what to ignore	3.29	1.05

According to Peter's OSORS results, he showed the highest use of GRS (M=4.47), followed by PSS (M=3.64) and SRS (M=3.5). During the think aloud protocol and interview, he reported that he distinguishes when he should read quickly or read closely which is consistent with his no. 12 result of a high score of 4.00 in OSORS. He thinks if the reading pieces come from news articles or something that does not have very deep meanings, he would read very quickly. Whereas when he comes across the academic reading, he would read very closely. He also mentioned that he always scrolls down to see how long the article is and observe the organization of the article and learn how to imitate the authors' writing styles which matches with his no. 8 result of a high score of 4.00 in OSORS. What is more, when he reads articles in Chinese, he always expresses his opinions about the content and analyzes why the authors write in some ways which is not that consistent with his no. 22 result of a score of 3.00 in OSORS.

Furthermore, although participants reported the highest use (M=4.53) of using context clues to help them better understand what they are reading online (no. 18), one of participants, Tom pointed out pre-reading questions help him understand the online articles, but also restrict him to look for the specific answers. In other words, when CFL' proficiency getting higher, the context clues from the online reading materials might in turn become an obstacle interrupting their thinking process.

Problem Solving Strategies. The following items of PSS are used to link with participants' OSORS results and their report during think aloud protocol and interview.

Table 3 L2 Problem Solving Reading Strategies

Category	No	Strategy	Mean	SD
Problem Solving Strategies	9	Trying to get back on track	4.24	0.56
	11	Adjusting reading speed	4.24	0.75
	7	Read slowly and carefully	4.12	0.86
	26	Reread when text becomes difficult	3.94	1.25
	29	Guess the meaning of unknown words or phrases	3.76	0.97
	20	Visualize information	3.53	1.12
	31	Skip words or section that are difficult or unfamiliar	2.94	1.09

In terms of PSS, Mark reported during the interview that a good Chinese reader is defined as a reader who read texts carefully and slowly which is consistent with his high score of 4 for no. 7 and no. 11 in OSORS. He usually skips the sentences that he does not understand when he reads the online Chinese articles, unless they are really important, he will try to write them down and ask his Chinese tutor for help. This statement corresponded with his no. 31 result with a high score of 4.00.

Based on the results of think aloud and interview about PSS, Fred mentioned that he sometimes visualizes what he reads to better understand the article which is consistent with his high score of no. 20 on OSORS. In addition, whenever Fred encounters ancient Chinese, he said he usually puts the phrases in the online dictionary to look up each meaning of the word and then guess the meaning of the whole phrase. When the dictionary cannot help him solve the problems, he usually reads the sentences a couple of times and slowly to see if he can understand it. This statement corresponds with his high score of 5 for no. 7 and no. 29 on OSORS.

Tom also mentioned the same strategies as Fred applied. He always reads the Chinese text more than once (no. 9). The first time reading helps him get the brief idea of the article. He tries to look up some examples or Chinese slang during the second time reading. He believes that reading the Chinese articles more than once will definitely help his reading comprehension.

Support Reading Strategies. Compared to GRS and PSS usages with high frequency, participants showed medium frequency usage (M=3.29) for SRS on the OSORS. Table 4 contains the information of L2 Support Strategies used by all participants. The following session has shown the analysis of the SRS in each question.

Table 4 L2 Support Reading Strategies

Category	No	Strategy	Mean	SD
Support Strategies	13	Use reference materials (e.g., an online dictionary)	5.00	0.00
	10	Print out a hard copy of the online text then underline information	3.59	1.18
	23	Go back and forth in the online text to find relationships among ideas	3.06	0.83
	27	Ask myself questions I like to have answered in the online text	2.65	0.93
	2	Take notes while reading online	2.41	1.06

Evidently, no. 2 taking notes while reading online accounted very low mean of 2.41, which implied that this strategy was least frequently used by CFL readers for better

reading comprehension. Correspondingly, no. 27 strategies also showed low mean value of 2.65, which inferred that CFL readers rarely asked themselves to have answered in the online text. The mean value 3.06 of no. 23 implies that CFL learners sometimes look back and forth for the relationships among ideas within the text. As Mark mentioned in the interview, when he met some difficult phrases, quotes or Chinese old sayings in articles, he normally just tried to figure out the English translation for the text. If he still had problems understanding the meaning of the text, he just moved on.

In addition, paraphrasing strategy (no. 19) showed the mean value of 3.96 indicating that CFL readers obtain better reading comprehension by restating ideas in their own words. It is interesting to find that some CFL readers such as Peter, Fred, and Tom like to paraphrase the ideas of context in Chinese while Mark prefers to think in English while reading. During the interview, Fred stated that he seldom translates the online Chinese text into English while reading because he can basically go through the article and comprehend it without English translation. Tom also pointed out that he likes to learn new vocabularies by using the synonym words that he has learned in Chinese. Relatively, for Mark, reorganizing his thinking in English helped him understand the online text deeply.

Furthermore, the higher mean of 3.59 was showed for the strategy of printing out the text (strategy no. 10). In other words, CFL learners sometimes take notes while reading online text, yet they often print out the online text, and then underline the information to assist their memorization of the text. Peter further explained that the reason he prefers to have an electronic version of the readings is because it is easier for him to look up the vocabulary by copying and pasting the online text. What is more, it is also convenient for him to make a record of personal vocabulary lists as a digital format. Additionally, Fred, Tom and Mark also indicated that they have a preference to print out the online readings for academic purposes. It is much easier for them to underline the text and write down the Pinyin (pronunciation in Romanization), tone and English translation on the sides.

As for most frequently used strategy under the category of SRS, all participants circled 5 (always or almost always do this) for using reference materials strategy (no. 13). According to Tom, whether readers have sufficient background knowledge of the text influences the way they interpret and comprehend the text. When he ran into difficulties of understanding the Chinese articles due to his lack of background knowledge of Chinese historical events or economy, he tried to look up some background information either in Chinese or in English. Similarly, during the process of think-aloud protocols, Peter even spent time on finding the original quote of the Chinese literacy language such as Mencius and Tsang's sayings mentioned in the think-aloud text. In short, all participants reported that they always look up some additional background information to help themselves understand the Chinese articles better.

4.2 What are the differences of online reading strategies that CFL learners use in L1 and L2?

This research question focuses on analyzing the different online reading strategies that CFL learners have used in English (L1) and Chinese (L2). The comparative data came from the results of the OSORS and the individual interview data were used to address this question triangularly. The descriptive results of OSORS showed that participants used more GRS (M=3.80) and PSS (M=3.87) in L1 contexts than then counterparts (M=3.56 and 3.74 respectively) in L2 contexts; whereas they used more SRS (M=3.29) in L2 contexts than in L1 contexts (M=2.63) (see Table 5).

Paired samples *t* test and Benjamini & Hochberg's (1995) False Discovery Rate procedure further indicated that participants used statistically significantly more GRS than SRS in L1 contexts ($t(16) = 7.038$, $p < .001$). It suggested that participants preferred to use GRS than SRS when reading English academic texts. As for SRS, participants used statistically significantly more in L2 contexts than in L1 contexts ($t(16) = 5.76$, $p < .001$). This showed that SRS were more needed by participants when reading Chinese texts than English texts.

Table 5 OSORS Results of L1 (English) and L2 (Chinese)

	L1 (GRS)	L2 (GRS)	L1 (PSS)	L2 (PSS)	L1 (SRS)	L2 (SRS)	L1 (Total)	L2 (Total)
Mean	3.80	3.56	3.87	3.74	2.63	3.29	3.58	3.55
SD	.61	.55	.36	.28	.63	.46	.43	.35

Furthermore, paired samples *t* test also showed that two items in PSS and two items in SRS had significant differences between L1 and L2 (see Table 6). These items with significant differences will be discussed with the results of think-aloud protocols and interview.

In PSS, participants can distinguish between fact and opinion significantly more in English (M=4.76) than in Chinese (M=3.76) ($t(16) = -4.408$, $p < .001$). Participants also looked for sites that cover both sides of an issue (M=3.7) in English contexts than in Chinese (M=2.82) ($t(16) = -3.273$, $p=.005$). Several participants mentioned that the reason that they looked for websites in Chinese less frequently than in English was because it was difficult for them to judge whether some Chinese websites are reliable enough for academic purposes, so they seldom use this strategy. On the contrary, they are more confident to judge the reliability of English websites, so they tend to use this strategy in English contexts. In addition, some participants mentioned that due to the lack of Chinese language proficiency and cultural knowledge, they sometimes have difficulty with distinguishing between fact and opinion in Chinese contexts than in English contexts.

Table 6 Items of reading strategy use that have significant differences between L1 and L2

Category	No	Strategy	L1 Mean	L2 Mean
Problem Solving	33	Distinguish between fact and opinion	4.76	3.76
	34	Look for sites that cover both sides of an issue	3.7	2.82
Support	10	Print out a hard copy and then underline or circle information	2.5	3.5
	13	Use reference materials (e.g., an online dictionary)	2.12	5

As far as the items that have significant differences under the SRS concerned, participants tend to print out the hard copy and underline or circle information significantly more frequently in Chinese contexts (M=3.5) than in English contexts (M=2.5) ($t(16) = 4.012$, $p=.001$). Several participants pointed out that have a preference to print out online readings for academic purposes because it is easier for them to underline the text and write down the Pinyin (pronunciation in Romanization), tone and English translation on the sides which can assist their comprehension of Chinese readings. However, they indicated that they do not need to do these when reading English texts.

What's more, all participants always use reference materials to help their reading comprehension while they seldom do this in English ($t(16) = 11.973$, $p < .001$). During the interviews, several participants reported that the greatest difference between reading Chinese and English online articles was about the context and vocabulary, so they need to use more reference materials in reading Chinese text to understand not only the language itself, but also the background knowledge of the topics.

5. Implications

The results revealed that participants highly relied on the reference materials when reading Chinese texts, so teachers should offer students several useful online reference materials and the strategies of using them to better serve their needs. For instance, in addition to looking up the meanings of unknown words, students also need to know how to use these words in sentences, and their syntactic features. Students at this advanced proficiency levels also have to expand their vocabulary inventory to help them read efficiently.

Moreover, in light of the results of the current study, these advanced CFL learners need to expose themselves more in Chinese culture to resolve the problems when they come across ancient Chinese texts or idioms since culture and language are inseparable. Therefore, it will be essential if Chinese teachers can increase CFL learners' cultural awareness by integrating Chinese culture into language teaching. For example, when teaching ancient Chinese texts and idioms, teachers can introduce the cultural background and history behind these phrases to help students deeply understand contents and contexts. Additionally, teachers can also take advantage of modern technological means, such as videos and movies, to explicitly show students' the Chinese cultural uniqueness. What is more, teachers can provide students with the real scenarios and societal

phenomenon to discuss and compare with American counterparts. In this way, these can not only indirectly boost students' confidence in judging the fact and opinion of the online information, but also develop their information-synthesizing and critical thinking ability.

6. Conclusion and limitation

This study examined online reading strategies among advanced CFL learners in two aspects: the metacognitive online reading strategies use and the differences of reading strategies use between CFL readers' L1 and L2. The results showed that participants used PSS more frequently than GRS and SRS. In addition, participants' use of GRS had significantly more than SRS in English. Their use of SRS in Chinese had significantly more than in English. Nevertheless, there are some limitations of this study.

First of all, the data obtained from the OSORS were self-reported by the survey information. These self-reported data might not be consistent with the think-aloud results because the participants may not use every strategy they have self-reported during the online reading process. Additionally, the participants might use varied strategies when they are reading the articles with different subjects or language levels. It is also possible that the learning style influences how participants use reading strategies. In addition, participants reflected their L1 online reading strategies use only through the OSORS survey and interviews which might also decrease the validity of the results. Thus, for future study, think-aloud tasks should be given both in English and in Chinese. The think-aloud reading materials could be in different subjects and levels in order to precisely compare the similarities and differences of online reading strategies use among CFL readers.

Second, the current research contributed to the clarification of what online reading strategies CFL readers use. Yet, this study did not explore the question of what makes a better model of L2 online reading ability. In order to develop new approaches in online reading instructions to facilitate CFL readers on web-based standardized tests, future studies might also consider to explore the question of what factors can be applied to improve L2 online reading ability by comparing different levels of CFL learners.

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Appendix 1: Online Survey of Reading Strategies

The purpose of this survey is to collect information about the various techniques you use when you read academic materials in Chinese (e.g., reading textbooks for homework or examinations, read journal articles, etc.).

All the items below refer t your reading of college-related academic materials (such as textbook, not newspapers or magazines).

Each statement is followed by five numbers, 1, 2, 3, 4, and 5, and each number means the following:

"1" means that "I never or almost never do this".
"2" means that "I do this only occasionally".

"3" means that "I sometimes do this". (About 50% of the time.)
"4" means that "I usually do this".
"5" means that "I always or almost always do this".

After reading each statement, circle the number (1, 2, 3, 4, or 5) which applies to you. Note that there are not right or wrong responses to any of the items on this survey.

	Statement	Never				Always
1.	I have a purpose in mind when I read online.	1	2	3	4	5
2.	I take notes while reading online to help me understand what I read.	1	2	3	4	5
3.	I think about what I already know to help me understand what I read online.	1	2	3	4	5
4.	I first scroll through the online text to see what it is about before reading it.	1	2	3	4	5
5.	When online text becomes difficult, I read aloud to help me understand what I read.	1	2	3	4	5
6.	I analyze whether the content of the online text fits my reading purpose.	1	2	3	4	5
7.	I read slowly and carefully to make sure I understand what I am reading online.	1	2	3	4	5
8.	I review the online text first by noting its characteristics like length and organization.	1	2	3	4	5
9.	I try to get back on track when I lose concentration.	1	2	3	4	5
10.	I print out a hard copy of the online text then underline or circle information to help me remember it.	1	2	3	4	5
11.	I adjust my reading speed according to what I am reading online.	1	2	3	4	5
12.	When reading online, I decide what to read closely and what to ignore.	1	2	3	4	5
13.	I use reference materials (e.g., an online dictionary) to help me understand what I read online.	1	2	3	4	5
14.	I use tables, figures, and pictures in the online text to increase my understanding.	1	2	3	4	5
15.	When online text becomes difficult, I pay closer attention to what I am reading.	1	2	3	4	5
16.	When academic sites have links to other sites, I click on them to see what they are.	1	2	3	4	5
17.	I stop from time to time and think about what I am reading online.	1	2	3	4	5
18.	I use context clues to help me better understand what I am reading online.	1	2	3	4	5
19.	I paraphrase (restate ideas in my own words) to better understand what I read online.	1	2	3	4	5
20.	I try to picture or visualize information to help remember what I read online.	1	2	3	4	5
21.	I use typographical features like bold face and italics to identify key information.	1	2	3	4	5
22.	I critically analyze and evaluate the information presented in the online text.	1	2	3	4	5
23.	I go back and forth in the online text to find relationships among ideas in it.	1	2	3	4	5
24.	I check my understanding when I come across new information.	1	2	3	4	5

25.	I try to guess what the content of the online text is about when I read.	1	2	3	4	5
26.	When online text becomes difficult, I reread it to increase my understanding.	1	2	3	4	5
27.	I ask myself questions I like to have answered in the online text.	1	2	3	4	5
28.	I check to see if my guesses about the online text are right or wrong.	1	2	3	4	5
29.	When I read online, I guess the meaning of unknown words or phrases.	1	2	3	4	5
30.	I scan the online text to get a basic idea of whether it will serve my purposes before choosing to read it.	1	2	3	4	5
31.	I skip words or sections I find difficult or unfamiliar.	1	2	3	4	5
32.	I critically evaluate the online text before choosing to use information I read online.	1	2	3	4	5
33.	I can distinguish between fact and opinion in online texts.	1	2	3	4	5
34.	When reading online, I look for sites that cover both sides of an issue.	1	2	3	4	5
35.	When reading online, I translate from Chinese into English.	1	2	3	4	5
36.	When reading online, I think about information in both Chinese and English.	1	2	3	4	5
37.	When I encounter difficult reading in Chinese, I seek material on the same topic in English.	1	2	3	4	5

Appendix 2: Text for Think Aloud Protocol

梁启超：最苦与最乐

人生什么事最苦呢？贫吗？不是。失意吗？不是。老吗？死吗？都不是。我说人生最苦的事，莫苦于身上背着一种未了的责任。人若能知足，虽贫不苦;若能安分（不多作分外希望），虽然失意不苦，老，死乃人生难免的事，达观的人看得很平常，也不算什么苦。独是凡人生, 在世间一天，便有一天应该的事。该做的事没有做完，便像是有几千斤重担子压在肩头，再苦是没有的了。为什么呢？因为受那良心责备不过，要逃躲也没处逃躲呀！

答应人办一件事没有办，欠了人的钱没有还，受了人的恩惠没有报答，得罪了人没有赔礼，这就连这个人的面也几乎不敢见他，纵然不见他的面，睡里梦里，都像有他的影子来缠着我。为什么呢？因为觉得对不住他呀！因为自己对他的责任，还没有解除呀！不独是对于一个人如此，就是对于家庭，对于社会，对于国家，乃至对于自己，都是如此。凡属我受过他好处的人，我对于他便有了责任。凡属我应该做的事，而且力量能够做得到的，我对于这件事便有了责任。凡属我自己打主意要做一件事，便是现在的自己和将来的自己立了一种契约，便是自己对于自己加一层责任。有了这责任，那良心便时时刻刻监督在后头，一日应尽的责任没有尽，到夜里头便是过的苦痛日子。一生应尽的责任没有尽，便死也带着苦痛往坟墓里去, 这种苦痛却比不得普通的贫困老死，可以达观排解得来。所以我说人生没有苦痛便罢，若有苦痛，当然没有比这个加重的了。

翻过来看，什么事最快乐呢？自然责任完了，算是人生第一件乐事。古语说："如释重负"，俗语亦说："心上一块石头落了地"。人到这个时候。那种轻松愉快，简直是不可以言语形容。责任越重大，负责的日子越久长，到责任完了时，海阔天空，心安理得，那快乐还要加几倍哩！大抵天下事从苦中得来的乐才算真乐。人生须知道有负责任的苦处，才能知道有尽责任的乐处。这种苦乐循环，便是这有活力的人间一种趣味。不尽责任，受良心责备，这些苦都是自己找来的。翻过来看，处处尽责任，便处处快乐; 时时尽责任，便时时快乐。快乐之权，操之在己。孔子所以说："无入而不自得" ，正是这种作用。

然而为什么孟子又说："君子有终身之忧"呢？因为越是圣贤豪杰，他负的责任越是重大，而且他常要把这种种责任来揽在身上，肩头的担子从没有放下的时候。曾子还说："任重而道远"，"死而后已，不亦远乎？"那仁人志士的忧民忧国，那诸圣诸佛的悲天悯人，虽说他是一辈子感受苦痛，也都可以。但是他日日在那里尽责任，便日日在那里得苦中真乐，所以他到底还是乐，不是苦呀！

有人说："既然这苦是从负责任而生的，我若是将责任卸却，岂不是就永远没有苦了吗？"这却不然，责任是要解除了才没有，并不是卸了就没有。人生若能永远像两三岁小孩，本来没有责任，那就本来没有苦。到了长大成人，责任自然压在你的肩头上，如何能躲？不过有大小的分别罢了。尽得大的责任，就得大快乐; 尽得小的责任，就得小快乐, 你若是要躲，倒是自投苦海，永远不能解除了。

阅读理解

1. 责任有种种，你能从课文中找出有哪几种责任吗？
2. 为什么"凡属我应该做的事，而且力量能够做得到的，我对于这件事便有了责任"？请举例说明。
3. 这篇文章的中心论点是什么？作者用哪些论据来证明论点？
4. "从苦中得来的乐，才算是真乐"，你同意这个说法吗？
5. 责任能够逃避吗？请说明在你目前的生活中，哪些责任是根本逃避不了的？逃避会有什么后果？
6. 每段都用一个问句开头，这种写法有什么好处？

Appendix 3: Interview Questions

Pre-reading

1. On a scale of 1 to 5 (5 being the highest and 1 being the lowest),
   - how much do you know about this topic?
   - how much does this topic interest you?

2. In your opinion, what do good English/CFL readers do when they are reading for information on the Internet?

Post-reading

1. On a scale of 1 to 5 (5 being the highest and 1 being the lowest),
   - how much did you enjoy the task you did today?
   - how successful were you at completing the task you did today?

2. In your opinion, what do good English/ CFL readers do when they are reading for information on the Internet?
3. If your teacher asked you to give advice to other English/ CFL learners about how to read on the Internet, what would you tell the students about the things that happen in your mind when you read on the Internet?
4. As you were searching on the Internet today, what worked best for you to find the answer in English/Chinese?
5. As you were reading from the Chinese materials, what reading strategies worked best for you to find the answer?
6. What kinds of things are helpful to know when you are reading Chinese materials on the Internet and trying to figure out what to read next? Are some of these more useful than others?
7. Do you ever find yourself making predictions as you read English/Chinese on the Internet? If so, explain when?
8. Do you think your L1 (English) influence the way you interpret L2 (Chinese) as you read Chinese on the internet? If so, explain how?
Does your L1 (English) promote your ability in L2 (Chinese) comprehension as you read Chinese materials on the internet? Give some examples?
9. What will you do when bumping into difficult words in Chinese/ English online materials?
10. What will you do when you cannot understand the meaning of the online Chinese/English text?
11. What do you think Chinese online reading and English online reading have in common?
12. In your opinions, what are differences between Chinese online reading and English online reading?
13. As a CFL learner, what are the strengths and weakness that you have in reading Chinese on the Internet?

中文教师对数位技术的认知之于中文教学中数位工具使用的影响

(The impact of the perceptions of information technology on the use of digital tools in teaching Chinese as a second language)

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摘要：为提高使用数位工具的效率和整体中文教学的水平提供依据, 本报告调查了 K-16 中文教师科技数位工具使用的现状, 试图了解教师的数位技术认知对教学中数位工具使用的影响。初步结果表明：1) 教师对使用数位工具认知的程度影响教师在课堂中数位工具的使用; 2) 教师认知越高，教师的数位工具使用的自我认知能力也越高; 3) 自我认知能力越高，课堂中使用的数位工具也就越多。这些结果确认中文教师在对数位工具的认知程度与数位工具的使用与其他科目的教师差别不大。本文最后也提出了提高教师数位工具使用认知的建议。

Abstract: This report examines the current use of digital technology tools by the K-16 teachers of Chinese in order to provide a basis for the improvement of effective integration of digital tools in teaching Chinese language. It aims to reveal the impacts of the teachers' perception toward the use of information technology on the actual use of digital tools in the classroom. The preliminary results indicate that: 1) the teachers' perception on the uses of digital tools affects how s/he actually uses these tools in the language classroom; 2) the high perception teachers have, the higher the self perceived ability toward the use of the digital tools; 3) the higher the teachers' self-perceived ability, the more they use digital tools in the classroom. These results confirm that Chinese language teachers' perception of the use of digital tools and that of teachers of other subjects are not very different. It also offers suggestions of ways to enhance the teachers' perceptions towards the use of digital tools in teaching.

关键词：中文教学，对数位工具的认知，数位工具的使用

Keywords: Teaching Chinese as a second/foreign language, perception towards the use of digital tools, uses of digital tools

1. 前言

随着网络数位技术的不断发展，语言习得的模式变得日趋多样化， 混合式教学，移动式教学对课堂教学的渗透日益常态化。不可否认数位科技的发展丰富了语言教学手段，多媒体教学、网络教学、移动教学等都在很多方面改变了语言教学的模式，学生自发的，自我管理互动式的学习方式（student-initiated, self-managed interactive learning by students at their own pace）对传统的语言教学提出了挑战（Kubler 2011）。研究发现合适的教育科技手段的使用可以提高学习者的学习动机，并刺激学习兴趣 (Kulik 1994, Warschauer 1996)。根据教师信念和数位工具的使用之间的高相关性，Teo 等学者（2008）提出从教师的信念可以预见教师在课堂上会实施什么样的教学手段。在实际的教学中，影响数位科技手段应用的因素众多，包括：教师的因素和外部教学环境的因素，Teo (2011) 认为其中教师的因素尤为重要。Buabeng- Andoh（2012）的研究指出，教师对数位工具的认知对其是否在教学中使用数位工具，并对科技手段和语言教学有效地结合起来有着极大的影响，其中教师对科技积极的态度更能激励其使用数位工具来进行教学。以上研究表明了教师对数位工具的认知在教学中的重要性。那么在中文教学中，这些研究结果是否适用？中文教师的认知对数位工具的使用有什么影响？因此本文的研究课题将延续上述的研究，并拓展与中文教学相关课题。本文提出的研究问题为：

中文教师对数位工具使用的认知对教学中数位工具的使用有什么影响？

这一基本问题的解答可以帮助我们认识教师的认知对在中文教学中使用数位工具的重要性，以及解答如何提高教师使用数位工具的认知，以便进一步探讨提高中文教师使用数位工具的策略和方法。

2. 文献探讨

本文探讨数位工具之于中文教学应用之契机与挑战，并深入检视影响教师使用数位工具的三大因素：个人因素、环境因素与科技应用因素。此外，并进一步讨论 Teo, Chai, Hung and Lee (2008) 所提出的教师对数位工具的认同与认知对其使用科技教学的影响。根据 Kubler (2011) 与 Beaty (2003)的观察，科技辅助教学的确帮助语言教学与语言习得的过程，同时激发了 e 世代学生学习语言的兴趣，但两位学者也同时指出必须以教学为主导的课程做为科技辅助教学的前提，方能达到事半功倍的效果，也就是笔者于 2012 年在费城 ACTFL 年会上发表的“教学至上、兴趣为主、科技为辅。” (Dai, Ruan and Yeh 2012)

文献探讨的部分包括两大部分：2.1 为影响数位工具使用的因素，2.2 为教师对使用数位工具的认知。

2.1 影响数位工具使用的因素

影响教师使用数位工具的因素的方面包括两个方面，个人内在的因素和外在的因素。个人因素包括教育水准、年龄、性别、教育经历、使用电脑的经历和对电脑的看法都会影响科技手段的使用（Schiller 2003，Teo 等 2008)。外在的因素包括：电脑网络的稳定性，技术支援，以及校方的支持程度，等等。 虽然外在的因素有时也会起到很重要的作用，不少研究表明内在因素更重要。Teo (2011) 认为在所有的有效使用数位工具的因素中，教师为关键因素。Teo 列出了以往相关研究中的五大要素：对有用性的认知（perceived usefulness)，对使用便利性的认知 (perceived ease of use)， 主观指标 （subjective norm），支援条件（ facilitating conditions）和对使用的态度（attitude towards use）。Teo 的研究小组更进一步调查了在新加坡的 592 位老师去验证他根据上述五大要素所归纳出的 9 个假设，即以上五个因素对使用的态度和使用的意愿的影响。从老师的自我报告的问卷中得出的结果是其中 8 个假设成立，只有有关主观指标的因素对教师的使用态度和使用意愿影响不大，其他四个因素都有影响。

其他研究则发现教师的工作量影响他们在课堂上使用科技工具。Samarawick-rema & Stacey (2007) 调查了在澳大利亚的城市校园中和使用学习管理系统有关的因素。他们使用了案例研究的方法，有目的地选择了 22 位使用网络方法在校园内和校园外授课的参与者。结果发现在课程中增加使用技术工具的教学量对于参与者来说极为困难。主要原因是教学任务不能够按时完成，也就是说使用技术工具并没有提高教学的效率。

Buabeng-Andoh（2012）也从个人、环境/单位和技术三个层面考察了影响教师使用数位工具的不同因素。 他提出了教师在使用数位工具中遇到的一些障碍：其中包括教师缺乏技术能力和自信，缺乏教学培训，缺乏合适的教学软件，没有接触数位工具的机会，陈旧的传统教学体系，教学大纲的局限等等。其研究指出焦虑、缺乏自信和使用能力，以及恐惧心理都会阻碍数位工具的使用，因而他认为了解影响教师使用数位工具的个人因素是切合实际的，了解这些障碍是如何影响教师和教学单位有助于在中文教学中提高数位工具的使用。

2. 2 教师对使用数位工具的认知

Jones (2001) 认为在教学中，教师常常会被校方（环境/单位）要求去使用数位工具，而这样的教学效果并不尽理想。研究发现教师的培训才是决定技术手段使用的有效性，而不是教室里是否有这些数位工具。也有研究指出教师对于科技的态度极大地影响了教学中数位手段的使用，假如教师对于教育技术的态度积极的话，就自然而然会在教学过程中采用数位手段 (Russell & Bradley, 1997)。Demirci (2009) 在土耳其的研究项目检视了教师对于使用地理信息系统的态度，该研究用问卷方式从 55 所高中采集了 79 位地理老师的数据，结果发现教师的积极态度是使用地理信息系统课堂教学成功的决定因素。

Rozell 和 Gardner (1999) 的研究也表明，教师电脑的经验和电脑使用的态度是成正比的。使用电脑的经验越多，教师的态度就越积极。2000 年美国国家教育统计中心(U.S National Centre for Education Statistics)的报告考察了教师的教龄与数位工具使用之间的关系，报告指出，在美国教龄短的教师比资深的教师会在教学中使用更多的科技手段。根据这份报告，有三年教龄的教师在课堂上有 48%的时间使用电脑，教龄在四年到九年的教师在课堂上有 45% 的时间使用电脑，教龄在十年到十九年的教师 47%的时间使用电脑，二十年以上的教师在课堂上使用电脑的时间是 33%。Lau & Sim (2008) 的研究则有相反的结果, 他们对 250 马来西亚的中学教师做的调查表明资深教师比年轻教师在教学中使用更多的技术工具， 原因是资深教师在教学、课堂管理和使用能力方面有更多的经验。这个结果和 2003 年 Russell,Bebell, O'Dwyer, & O'Connor 所做的研究相吻合，后者发现年轻教师尽管在技术方面能力较强，但在课堂中使用科技手段并不多。本报告也试图了解资历对中文教师使用数位工具的影响。

3. 研究方法

本问卷调查采用的是描述性的研究方法 (descriptive research method)。通过对教师的认知和使用数位工具等数据采集来分析各变量之间的相关性 (correlation), 使用的统计软件是 SPSS （Statistical Package for the Social Sciences），此一软件为国际认可的专业统计软件。问卷中的变量基本都是用 Likert scale 的方式分成五等，并用 1 至 5 代表各个等级，如：不重要（1）、不太重要（2），一般（3）、重要（4）、很重要（5），然后采用斯皮尔曼序列值相关(Spearman 's rho correlation coefficient) 的方法来统计变量之间的相关程度。斯皮尔曼相关分析用于序列数的数据，我们问卷中采集的数据大多是序列数数据。 按常规， 我们将斯皮尔曼序列相关 测定数据有效值定为 $p < .05$， 就是说当 p 值小于 .05 的话，即得到的相关性数值错误的可能性小于百分之五，相关性的数值就具有统计意义。由于我们不知道变量之间的相关方向，正负相关都有可能, 所以我们在统计时，选择的是双尾相关检验（two-tailed），所有得到的相关数据都是双尾的。我们也因此指导变量之间的相关方向。

研究中发现中小学教师、大学教师和同时在中小学和大学任教的教师之间在认知和使用数位工具方面存在着些许差异。在得出整体数据后， 笔者再分别以上述三组为单位，得出三组的数据加以比较。

3.1 确定问卷的有效性和可靠性（Validity and Reliability）

本问卷是采用加州蒙特雷国际研究学院 （Monterey Institute of International Studies, A Graduate School of Middlebury College, CA）在校园中针对全体教职员使用过的调查问卷，该问卷的目的是了解教职员在校园和教学中使用数位工具的状况, 提高教学人员数位工具使用培训的品质，为制定教学政策做依据。笔者根据数位工

具在中文教学中使用的需要作了相应的修改。 数据的可靠性是用分半方式的 Cranbach's alpha 的值来判断， 即将问卷中个变量的数值分半对比，计算其相关值。

3.2 参与者和数据收集

问卷设计方式采用谷歌（Google）文件分享的方式，使用问卷网页的链接，通过传单或电子邮件发给中小学和大学的中文教师。大部分的通知单是在全国性的中文教师专业会议期间发给参加会议的教师们，如全美外语教师大会，美国外语教师年会等，同时也通过各级中文教师协会的成员电邮网发送问卷通知。由于中国大陆的教师暂时不能使用谷歌，笔者还通过电子邮件将问卷的文档传送给自愿参与者。参与者完成之后，再通过电子邮件发还。为了方便台湾和其他海外教师的参与，本问卷还创建了简体字和繁体字两个版本。同样，不方便在网络上完成问卷的教师可以通过电子邮件的方式完成。

3.3 问卷中的变量/因素

1. 参与教师的分类（Groups/categories ）: 本研究根据教师任教的学校将教师分成三组：中小学教师，大学教师和混合教师， 混合教师指的是同时在中小学和大学任教的教师。
2. 从事教学的年数/教学资历（Years of teaching experience ）: 此项包括以下四个等级，1 是教学年龄少于 5 年；2 是 6 至 10 年，3 是 11 至 20 年，4 是超过 20 年。
3. 教师拥有数码器件的数量（Number of digital devices owned by teachers ）：教师自己拥有和使用的数位工具，包括：台式电脑、手提电脑、智慧型手机、电子相机、电子阅读器、便携式多媒体播放器、扫描器等。
4. 数码器件在课堂中使用的数量（Number of digital devices used in the classrooms）：问卷询问了教师在课堂中使用过的数位工具，并统计这些工具的总数。
5. 教学中数位技术使用重要性的自我认知（Perception of the importance of the digital/information technology in teaching）：教师对各个数位工具在教学中的重要性，分别用五个等级来表示：一点不重要，不太重要，一般，比较重要，很重要。
6. 自我认知的数码工具使用能力（Self-perceived computing abilities ）：教师自我认知的使用数位工具的能力，而非考级或认证过的能力。
7. 自我认知的数码工具在教学中使用的能力（Self-perceived abilities in using information technology in teaching）：教师自我认知的在课堂上使用数位工具的能力。与上项相同，这个能力不是考级或认证的能力。

问卷还加入了数码工具使用的焦虑（Anxiety in using information technology ）的项目， 以进一步检视如何通过教师培训来降低焦虑的程度。但此项不是本研究的重点，不在本报告的范围内。

4. 结果

根据上述研究方法的设定，本研究试图考察所提出的问题，即：中文教师对教学中数位工具使用的认知对教学中数位工具使用有什么影响？通过个变量之间相关性的考察，来分析这些相关性数据对中文教学中使用数位工具的一些现状。 需要重申的是本研究并没有试图去考察个变量之间的因果关系。这些分析结果的目的是解答教师的认知是否在中文教学中也对数位工具的使用有积极影响的问题，并提出提高教师使用数位工具认知的一些做法，这些结果也为今后研究探讨提高教师使用数位工具的策略和方法提供数据和参考。

4.1 确定问卷的可靠性

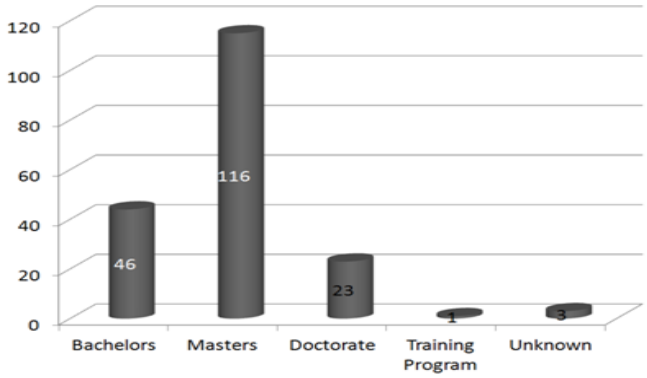
数据的可靠性是用分半方式的 Cranbach's alpha 的值经过 SPSS 的计算是 76%，此数值显示本问卷有较高的可靠性。

4.2 问卷回复者的基本情况

本问卷收集到的答卷共 188 份， 其中女性 145 位，占 78%； 男性 42 位，占 22%。见（图一）

图一 教师性别比例

在所有的受访者中，44 位拥有学士学位，118 位老师拥有硕士学位，博士学位的有 23 位 （见图二），一位老师接受过教师培训。上述的比例和目前从事中文教学老师们所拥有的学位比例基本相仿。 在收到的有效问卷中，共有 159 份简体字问卷和 29 份繁体字问卷。



图二 教师接受的最高教育

参与的老师年龄分布为 25-35 岁 55 位、35-45 岁 52 位、45 岁以上共 87 位。参与者在中国大陆任教的 45 位、台湾的有 50 位、美国 75 位，其余各来自澳大利亚、巴西、加拿大、德国、马来西亚、泰国、英国和新加坡等国家和地区。中小学（K-12）教师共有 77 位，大学教师共 65 位，既在中小学又在大学任教的共有 44 位，两位答卷者不在学校任教（行政人员或学生）。表一展示了教师背景的数据，其中包括年龄、教龄和三组教师人数。

表一 教师的背景资料：年龄、教龄和类别

1. Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25-35	55	29.3	29.3	29.3
	35-45	52	27.7	27.7	56.9
	45 above	81	43.1	43.1	100.0
	Total	188	100.0	100.0	

2. Years of teaching

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 5 yrs	68	36.2	36.2	36.2
	6-10 yrs	51	27.1	27.1	63.3
	11-20 yrs	34	18.1	18.1	81.4
	>20 yrs	35	18.6	18.6	100.0
	Total	188	100.0	100.0	

3, Type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	high school	77	41.0	41.4	41.4
	college	65	34.6	34.9	76.3
	mixed	44	23.4	23.7	100.0
	Total	186	98.9	100.0	
Missing	System	2	1.1		
Total		188	100.0		

4.3 变量之间的相关程度

初步结果显示中文教师对使用数位工具的认知和教学中数位工具的使用有中等程度相关，而教师的认知和自我认知的使用数位工具能力之间则有较高程度的相关。以下是笔者从对使用数位工具的认知、自我认知使用数位工具的能力、实际教学中使用数位工具的数目、以及中文教师个人背景等方面来介绍问卷结果，以及对这些结果的分析。笔者需要特别指出的是这些结果表明的是不同变量之间的相关程度，即某一自变量对另一个因变量是否有影响，而不是试图去证明这些变量之间的因果关系。

4.3.1 对数位工具使用的认知与课堂上实际使用数位工具数目的相关性

皮尔曼序列相关值（Spearman correlation） $r = .396$, $p < .001$, $n = 185$。这个结果表明这两个变量之间具有统计意义的中度正向相关，即教师对数位工具使用的认知越高，教学中实际使用的工具数目越多。这个结果与 2000 年美国教学研究中心的研究结果相吻合，表明了中文教师对教学中使用数位工具的认知的程度高低直接影响到他们课堂上实际使用数位工具数目。如果再进一步分析三组教师的情况，可以看出，高中组的数据（.261）要低于大学组(.464)和混合组(.427)，而大学组和混合组的数据则较为接近 （表二）。

表二 三组教师的认知和实际使用数量之间的相关性数据

高中组	大学组	混合组
$r = .261$ $p < .05$ $n = 76$	$r = .464$ $p < .001$ $n = 65$	$r = .427$ $p < .004$ $n = 44$

4.3.2 对数位工具使用的认知与自我认识的数位工具的使用能力的相关性

Spearman correlation $r = .672$, $p < .001$, $n = 185$。这两者之间具有统计意义的中度偏强相关，即认知越高，自我认知的能力也越高。这个数据表明提高教师对使用数位工具的认知对提高使用数位工具的自信有积极影响。混合组和高中组的数据要高于大学组的数据（表三）。

表三 三组教师的认知和使用能力之间的相关性数据

高中组	大学组	混合组
$r = .686$ $p < .001$ $n = 76$	$r = .524$ $p < .001$ $n = 65$	$r = .745$ $p < .004$ $n = 44$

4.3.3 教师自我认知的数位工具使用能力和教学中数位工具使用数量之间的相关性

Spearman correlation $r = .33$, $p = .01$, $n = 174$。这两者之间具有统计意义的弱相关，表明教师自我认知的数位工具使用能力越高，教学中使用数位工具的数量越多，这也说明了自信对实际使用有直接的影响。高中组的数据低于大学组和混合组的数据 （表四）。

表四 三组教师的使用能力和实际使用数量之间的相关性数据

高中组	大学组	混合组
$r = .238$ $p < .05$ $n = 76$	$r = .524$ $p < .001$ $n = 65$	$r = .542$ $p < .001$ $n = 44$

4.3.4 教师的资历与教师对数位工具使用的认知的相关性

Spearman correlation r = -.187, p = .013, n = 176。这个数值表明两者有统计意义负值弱相关。这一结果表明教师的资历和教师对数位工具使用的认知之间是呈现弱反相关，也就是说中文教师的教龄越久，对数位工具使用的认知越薄弱，而这种相关性比较弱。这个结果和 2000 年美国国家教育统计中心的调查结果是一致的。分三组之后，所得到的相关性数据都没有统计意义， 也就是说误差率都要高于百分之五。

4.3.5 资历与教师自我认知的数位工具使用能力的相关性

Spearman correlation r = -.241, p = .001, n = 175。 这个数值表明两者之间具有统计意义负值弱相关，即教师的教龄越高，自我认知的数位工具使用能力越低。自信不足可能是实际使用较少的一个因素，而缺乏数位工具的培训可能也是另一个影响的因素。同上面一项相同，分组后，所得到的数据误差值高于百分之五，因而，得到的相关值都没有统计意义。

由上面 4.3.4 和 4.3.5 两项的结果来看，教师的教龄对教师的认知和教学中使用数位工具有着消极的影响，年轻教师在教学中使用更多的数位工具，并且他们的认知度也高于资深教师。这可能和中文教师的个经历、教育背景和培训有较多的关系。如何让资深教师也能积极使用数位工具，这是教师培训工作中的一个挑战, 也是今后中文教师培训研究的一个重要课题。

4.3.6 资历与教学中数位工具使用的数量之间的相关性

Spearman correlation r = .15, p = .045, n = 176, 两者之间有统计意义的弱相关。这表明教学资历对教学中实际使用数位工具的使用有影响，但影响不大。分组后统计，只有高中组的数据有统计意义，即 r = .224, p = .05 ., n = 77；这个数据要高于总体的数据。 表五显示三组教师中各个变量的平均值（mean）和标准偏差（standard deviation）。

表五 各组变量的平均值和标准偏差值的比较

	高中组	大学组	混合组
教学年龄 Years of Experience	2.09/1.13 （6 至 10 年）	2.26/1.13	2.32/1.21 *平均教龄稍高于其他两组
自我认知的电脑技能 Self-perceived computer skills	40.89/12.01	39.95/13.14	40.66/16.36 *三组数值比较接近
对使用数位工具认知 Perceptions	75.96/18.56	70.48/22.50 * 此组的平均值低于其他两组。	75.14/28.37

课堂中使用数位工具的数量 Devices used in the classroom	6.79/2.89 *此组数值最高。	5.66/2.59 *此组的平均值低于其他两组。	6.36/3.42
自我认知的教学中应用数位工具的能力 Self-perceived ability to integrate technology into teaching	64.11/21.22	59.74/20.05 *此组的平均值低于其他两组。	63.77/26.23

5. 讨论总结

本研究数据分析结果指出中文教师对数位工具使用的认知对数位工具的使用和数位工具使用能力有着积极的影响，此一结果与 2000 年美国国家教育研究中心的有关研究结果相吻合。这也确认了教师对数位工具使用的认知在影响数位工具使用的诸多因素中的重要地位。虽然研究仍需对两者之间的因果关系做进一步的考证，其相关性已为我们确认了中文教师对教学中使用数位工具认知的重要性。从研究结果可以推断出提高教师的认知水平有助于数位工具在中文课堂教学中的使用。我们认为通过下列的方式可以提高中文教师使用数位工具的认知。

1. 通过各种方式，特别是通过网络视频、论坛、刊物和教学会议，向中文教师提供使用数位工具课堂教学的实例 （best practices），让老师们体验数位工具使用在教学中的实际作用，明确数位工具在促进语言教学中的积极作用。
2. 鼓励中文教师分享使用数位科技教学的经验，并鼓励合作教学，由熟悉使用数位工具的老师与其他老师合作，在课堂教学中让老师体验数位工具的实际效用，在课堂教学中直接学习数位工具的使用，提高教师使用数位工具的自信心。
3. 有系统地在学区和学校里提供教师培训，循序渐进。根据实际教学目的，展示各种数位工具的使用，使教师们能够提高数位工具使用的认知和能力。
4. 学区和学校为教师提供更好、更友善的教学环境，全力支持教师在课堂中使用数位工具。在需要时，为教师提供及时的技术支援，消除使用数位工具的担忧和恐惧。

本研究引起笔者重视的另一个数据是教师资历与数位工具使用和数位工具使用能力的负相关。在此项问卷中，教师在接受的数位工具使用的培训方面没有显示出明显的差别。但从实际的情况来看，由于生活的年代不同，年轻教师在使用数位工具方面要比资深教师更熟练些。从教师培训的角度来看，更多地给资深的老师提供并介绍一些简单易用的数位工具，更多地关注和帮助资深教师提高他们的认知，引导资深教师们在教学中更多、更有效地使用数位工具将有助于改变这种状况。如何提高资深教师在教学中更多地使用数位工具也是今后中文教学研究的一项重要课题。上述的研究些结果确认了先前其他科目对教师数位工具认知的调查结果，尽管中文语言教学有很多的特殊性，但是中文教师在对数位工具的认知程度与数位工具的使用于其他科目的教师差别不大，教学中数位工具使用的共性对中文教学有一定的指

导意义，可以推断相关的语言教学中数位工具使用的研究结果应该也适用于中文教学。由于本问卷设计还存在不少局限性，有的方面没有更深入地去了解，如资深教师使用数位工具受到哪些方面的影响，教师如何在课堂中使用数位工具等。这些都有待于今后的研究去更深入地了解，今后的研究也包括教师的认知度与数位工具使用的有效性之间的相关性，从而提出更具体的提高中文教师的认知度策略和方法，以便更有效地使用数位科技进行中文教学，提高中文教学的水平。

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Examining the role of computer-assisted practice in enhancing learner's perception and retention of Chinese pronunciation (计算机辅助语音训练对学生的汉语语音感知及读音记忆的作用研究)

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Abstract: This paper explores the possibilities of using computer-assisted pronunciation practice in teaching Chinese as a foreign language to help students to have a better perception and retention of what they practice. The initial experiment had 8 participants and a year later 8 more students from the University of Zimbabwe participated in this experimental practice method where participants were recorded producing some Chinese sounds and phrases under strict guidance of the teacher, and then edited audios and videos were given back to the students for their own listening practice. The experiment showed that this method could help students to improve perception as well as retention of the Chinese sounds. The method is also motivational in the sense that it gives students confidence as they can hear themselves producing Chinese phrases better than they would imagine. The method also proved to be an effective self-evaluation tool for Chinese language learners since students could compare their own pronunciation with that of the native speaker. This paper concluded that; though this pronunciation practice is time consuming, it can be an effective teaching method if it is supported by both teachers and students.

摘要: 本文对在非目的语言环境下汉语学习进行了计算机辅助的发音练习实验。十六个津巴布韦大学的学生参加了此实验，在实验录音过程中学生根据老师的发音念汉语声母和短句，最后老师把编好的录音做出来音频给发音人听。实验结果表明，除了增加学生的汉语发音感知及记忆，这种语音练习也能够增加学生的说汉语自信心。这个方法也是一种有效地发音的自我评价工具，因为学生可以把自己的发音和以汉语为母语人的发音比较。虽然这种发音训练耗时，但是如果有师生的配合是有效的语音练习。

Keywords: Computer-assisted practice, sound perception, non-target language environment

关键词: 计算机辅助的辅音练习；语音感知；非目的语言环境

1. Introduction

This paper aims to explore the possibilities of using computer-assisted practice in language teaching in order to help students to have better perception and retention of both new Chinese sounds and vocabulary. The research examines some of the procedures that were applied initially to 8 University of Zimbabwe part one students who were studying Chinese language in Zimbabwe as a way of helping them improve their perception of the Chinese sounds as well as to remember what they practice. The experiment was applied again to 8 more students a year later following same procedures and results were collected through questionnaire methods, discussions as well as observations. According to Gilbert (1995: 1) if learners cannot hear well, they are cut off from the language they are studying, and if they (learners) cannot be understood easily, they are also cut off from conversation with native speakers." Wong (1987) also agrees with this point thus he says that even when the non-native speakers' vocabulary and grammar are excellent, if their pronunciation falls below a certain threshold level; they are unable to communicate efficiently and effectively. This shows that there is the need for all foreign language learners to strive for good pronunciation. However, as Nooteboom (1983) noted, speech production is affected by speech perception, thus there is need to work on speech perception first for the learners to have better pronunciation as well as better listening abilities.

In order to attain better pronunciation one has to have good perception of the target language's sound system. It is not possible for language learners to be able to produce a sound they cannot hear. Fachun Zhang and Pengpeng Yin (2009) also agree with this notion, thus they argue that; "if you cannot hear it [target language sound] then you cannot even attempt to pronounce it, and the problem of perception needs to be overcome before any progress can be made".

In foreign language learning the traditional pronunciation practice methods include; imitating the teacher, listening to native speakers, listening to radio or television programmes, listening to native speakers' recorded audios and reciting, etcetera. These methods are quite effective not only in a non-target language environment but also when learning a given language in its target environment; however, the major challenge we were facing at the University of Zimbabwe during Chinese phonetic and lexical practice was that the teacher would engage students in repetitive practice which were proving to yield little results since the majority of students would forget what they practice and during review of previous lesson the majority of students would have forgotten what they practiced in the previous lesson. The process was not only time consuming but also tiresome and discouraging for both the students and the teacher.

In our classroom phonetic practice the teacher would make the student or students imitate him until the given student or the majority of students are able to at least imitate

the given sound or phrase correctly or just fairly correct. This practice method has the following indirect assumptions:

1. The student has already grasped the sound or given phrase;
2. The student will remember that given sound or phrase;
3. After class the student will be able to imitate the teacher without the teacher's guidance.

After class students would be expected to listen to audios and practice on their own, but many students complained that the voices they were hearing from the Chinese audios were too difficult to imitate and they would not hear anything except just a combination of sounds thus they would forget most of the sounds and phrases learnt in previous class practice. In other words they were "phonologically deaf" as Pierre Badin, Gérard Bailly, and Louis-Jean Boë (1998) would put it. As a result, poor perception of the Chinese sounds was negatively affecting students' pronunciation. Such complains and pronunciation problems in Chinese might not be attributed to Zimbabwean students only but possibly to many other students learning Chinese language. This is possibly because the Chinese sound system is completely tonal and has confusing consonant sounds such as zh[tʂ], ch[tʂʻ], sh[ʂ], j[tɕ], q[tɕʻ] and x[ɕ].

Therefore, in order to improve students' perception of Chinese sounds as well as to help them remember the different sounds and phrases they learn, there was a necessity to engage students into an active practice in the presumption that their pronunciation would in turn improve. This is the reason why there was an attempt to use computer-assisted practice where through the use of sound editing software students would be able to listen to their own voices and compare their own pronunciation with that of the native speaker. The main aim was to improve students' sound perception of the sounds Chinese language which seemed to be "alien" to them.

1.1 Aims and justification

This research aims to show the possibilities of using students' own pronunciation through sound editing software to help improve sound perception of Chinese's sound system, which in turn helps to create a base for pronunciation practice. Though this research is basically based on the University of Zimbabwe's Chinese language teaching and learning experience; it is also expected to benefit other researchers, foreign language teachers and learners who are not necessarily researching, teaching or learning Chinese language only.

This research was carried out after teaching Chinese language for a semester of about 3 months at the University of Zimbabwe. It was observed that even after three months of 6 contact hours per week students were still complaining that they could not understand what they hear from the audios, also some were still forgetting what they would have learnt and some were even still mispronouncing basic Chinese sounds. This was possibly due to the fact that students had low motivation in the subject and apart from practice in class there was no other platform for practicing their pronunciation for

Chinese sounds. Therefore, this research was carried out to provide students with a platform for practice; it was also meant to raise students' listening ability.

1.2 Conceptual framework and hypotheses

This paper is based on the hypothesis that the sounds of a foreign language can be difficult for a learner to perceive if these sounds are uttered by a native speaker of that given foreign language, but they would be easier to grasp if uttered by the learner him/herself. In other words perception for a foreign language's sounds is mainly made difficult to perceive because the sound is produced by a voice that the learner is not used to, thus if the same sound could be produced appropriately by a native voice then the learner would be able to grasp and imitate. Adrian Wagner (2012) argued that perception of unfamiliar foreign language sounds without first language equivalent is troublesome. This therefore implies that in second language learning sound perception of the native language forms the base of acquisition of the target language. Adrian Wagner (ibid) further explained that; "once perception of foreign speech sounds is accurately established, this perception provides a foundation for accurate production". It is also believed that when one has learnt a first language, other speech sounds are typically perceived in terms of the phoneme categories of the native language (Vincent J. etal 2001:103).

In this paper it is therefore hypothesized that it is possible to improve learners' sound perception for a foreign language by recording the learner under teacher's guidance after which among the learner's recorded sounds a correctly produced sound or a closer to standard pronunciation sound will be selected. The learner will then listen to his or her own pronunciation which is native to him or her; this will then form the base of acquiring a foreign sound. By comparing his/her own pronunciation to that of the native speaker, the learner will be able to attain a better perception and pronunciation of the foreign sound.

1.3 Research questions

This research seeks to answer the following questions:

1) Will computer-assisted practice help students improve their perception of Chinese sounds?
2) Will computer-assisted practice help students not to forget what they practice?
3) Will computer-assisted practice motivate students to practice their pronunciation outside the target language's environment, especially in an environment where students are not highly motivated to learn the given target language?

1.4 An overview of sound perception and pronunciation practice

There are much researches relating to sound perception and pronunciation practice in second language learning such as Major, R.C. (1987), Flege, J. E. (1995), and Rochet, B. L. (1995). Many of these researchers agree with the notion that language

learners outside the target language environment normally experience listening challenges. For instance, Flege (1995:234) states that "foreign accents may make non-natives difficult to understand, especially in non-ideal listening conditions." It is also generally agreed that poor sound perception is the main cause for listening challenges. According to Dr. Alfred Tomatis as quoted in Thompson (1993:152); "before children speak a language, they must be able to hear the particular sounds and auditory frequencies of that language". This therefore suggests that the base for good pronunciation is good perception of the target language's sounds. There are many suggestions from different researchers on how to attain good pronunciation; for instance, Patricia Ashby (2012) recommends that at the tertiary level a short introduction course in articulatory phonetics course could be helpful for foreign language learners.

John Field (1995) proposes dictation as one of the ways of promoting lexical perception. However, in order to improve language learners' sound perception and pronunciation practice especially outside the target language environment there have been so much technological developments across the world. Computer-assisted language learning popularly known as (CALL) is one example of such developments. According to Levy (1997: 1) CALL is an attempt to apply computer technology in language teaching. Some scholars call it Technology-enhanced language learning. According to Nazlı Gündüz (2005) in CALL the learner is first presented with a rule and some examples, and then answers a series of questions which test her/his knowledge of the rule and the computer gives appropriate feedback and awards a mark, which may be stored for later inspection for the teacher. Many scholars believe that CALL method can strengthen learning motivation and provide immediate feedback that encourages subsequent learning (Heift & Rimrott, 2008; Hmard, 2006).The method can be used to reinforce what the student has already learnt in the classroom or as a remedial tool to help learners who require additional support. Some of these CALL manifestations include virtual learning environment and Web-based distance learning, below are other computer related language learning methods.

One such development includes the Virtual Talking Head and Speech Mapping proposed by Pierre Badin, Gérard Bailly, and Louis-Jean Boë (1998). In this method the teacher uses audio-visual speech stimuli in order to evaluate and improve the learner's perception of the target language's sounds as well as helping the learner produce the corresponding articulations by acquiring the internalization of the relations between articulatory gestures and resulting sounds. All such methods, however, require skilled and expensive technological support that might not be afforded in developing countries such as Zimbabwe.

Most developed countries are now developing language learning software programs to help language acquisition mostly outside the target language environment. For example, there are so many foreign languages' learning software programs such as; the Rosetta Stone software, the 101 Languages of the World software, the Instant Immersion 33 Languages software, and many others. Such software programs follow the notion that "in second language teaching many teachers test listening rather than teaching it" (Sheerin 1987). The modern language learning software programs allow the learner to

practice their pronunciation by giving the learner an option to record him or herself, and a computer compares the learner's pronunciation to that of the native speaker after which it gives a score for resemblance level.

For example, when using Instant Immersion 33 Languages software, one needs a computer or just a CD player, a sound card and a microphone for the practice. This learning software is more like a game where you play and win or lose. For pronunciation practice the speaker plays a word and immediately repeats it into the microphone, then play back the sequence and can hear the speaker's pronunciation compared to the native speaker. San Antonio, former president of Alamo PC, in a review of the Instant Immersion 33 Languages software, mentioned that at the end of practice session she felt quite confident with several words and phrases. Also she felt the process was quite funny since the program is totally aural and does not require reading. (http://www.alamopc.org/pcalamode/reviews/current/R20040703.shtml).

While all such software programs might be effective in language learning in many countries, the situation is completely different in Africa especially in Zimbabwe. Though at the present many people are now using computers and internet in Zimbabwe, it should be noted that the motivation to learn foreign languages is low and cannot be compared to that of students in developed countries. Also students do not buy these software programs due to economic hardships, lack of interest, lack of information about such software programs, lack of technological know-how, and many other reasons.

There are also other pronunciation learning methods such as shadowing; this is a language learning technique developed by the American Professor Alexander Arguelles, where an audio in the language that you are learning is used as the bases, while listening to the audio, you attempt to repeat immediately after hearing it. This method might be effective if the student is able to discern the sounds he or she hears from the audio, so for the University of Zimbabwe students it could have been ineffective since the students were having problems in imitating what they hear from the audio. At this point it is important to describe the Chinese language learning situation at the University of Zimbabwe.

In the case of the Confucius Institute at the University of Zimbabwe, many students enroll into the Chinese language program not because they like the subject but mainly because they have been given the option by the school authorities. There are a few Short Chinese course students (mainly travelers or business people), and the rest of the students do Chinese as a third subject for their Bachelor of Arts curriculum, a foreign language course for Tourism and Hospitality Degree or as an optional course of Honors in Linguistics Degree. There are also a few curious students from such departments as Psychology and Business Studies. This thus entails that these students are basically over-occupied with other core-courses, and they do not have the motivation to speak Chinese; rather, they just want to pass the course. In order to engage these students and give them confidence that they could speak Chinese, there was therefore the need to directly and indirectly motivate the students, to make them realize that they have the potential to speak Chinese fluently or better than they could imagine.

1.5 Research methods

An experimental approach was used with students varying from early beginners to upper level beginners. Students were recorded producing the 21 Chinese consonants, the four tones and phrases listed in the Appendix 2, and their sounds were edited to make continuous audios which were then given back to the participants as part of their sound practice. The impact of the experiment was then evaluated by both teachers and students.

The whole experiment was evaluated through discussions with other Chinese language teachers. Discussions were quite helpful in terms of providing ideas on how to improve this approach of computer-assisted practice. Apart from discussions, questionnaires were also used to gather information about the students' experience and feelings during the experiment and after watching the videos. Recorded audios were also played to other students who were not part of those who participated in the recording process and questionnaire method was used to gather their comments and opinions on this Chinese learning approach. This was helpful in evaluating the experiment's impact to both the participants and non-participants.

In the follow up experiment done in 2013 Praat software was used for analyzing the students' tone structure before and after the computer-assisted practice. The results were then compared to establish if there was any improvement in students' tone perception.

2. Experiment design and aims

8 students from the Confucius Institute at the University of Zimbabwe participated in the first experiment, for more details about the participants see Appendix1. Before the experiment was done it was advertised both on the Confucius Institute's Facebook group and in class inviting students to participate in the pronunciation practice, only 8 out of 41 students from the 2011 Bachelor of Arts level 1 class responded positively. This was possibly because most students had already lost hope or they were possibly not motivated to learn Chinese. The experiment was divided into two parts: the first was a Chinese lexical and semantic computer-assisted practice, and the second was a Chinese phonetic system computer-assisted pronunciation practice. The experiment was divided into two parts so as to find out if the same method could be applied for other pronunciation practice apart from phonetic practice. The same experiment was later repeated with yet another set of 8 students in 2013 who were selected from among the part one students who were having problems in differentiating between the second and third Chinese tones.

The experiment was designed as a way of capturing and preserving that moment when the student's imitation of the teacher becomes closer to that of the native speaker or when it is completely perfect. Once this moment is captured the student will have an opportunity to listen again to his or her own voice when he or she was producing the Chinese sounds and or phrases appropriately. This would be achieved by editing where

all the wrong sounds would be removed and only the correctly produced sounds would be retained. The assumption here is that some students will forget how to produce a sound despite excellent production during practice in class with the teacher. Therefore, by retaining these well produced sounds, the student will be reminded of his or her ability and then by continuous imitation of his own pronunciation he or she will be able to remember the sounds or phrase without the help of the teacher.

2.1 Materials used

Recording and editing process required; Computer, microphone, recording software, sound editing software, video editing software and a camera. The participants of this experiment were supposed to have any one of the following: computer, cell phone that can play mp3 audios, mp3 player, or anything that could play audios or videos. Some participants did not have personal computers or any of the above so they had to borrow from their friends.

2.2 Task

Four participants for the lexical pronunciation experiment were given short written dialogues which they had to memorize or just familiarize with over a period of 2 days. The dialogues were written in both characters and pinyin because almost all the students could not read Chinese characters by the time of recording. On the day of recording each word or phrase was then read under the guidance of the teacher. During recording the teacher would read the sound or phrase while the student imitate. The whole process was recorded in order to capture that moment when the student would produce his or her best sound. As many sounds as possible were recorded until the teacher feels that the student has managed to imitate the sound or phrase either correctly or just fairly well.

For the phonetic experiment, the other participants were asked to read the 21 Chinese consonants produced with vowels as shown on Appendix 2 and the 4 Chinese tones using the syllable [ma]. For the 2013 follow up experiment, 8 students who were having problems in differentiating between second and third tones were recorded two days before and five days after the experiment and results were compared using Praat analysis. During the pretest the students would produce the syllable [ma] with the four Chinese tones without teacher's guidance; the same was repeated after the experiment. Praat software was then used to analyze the tone structure and levels.

For the lexical and semantic experiment the participants had to do a video recording for the situation in the dialogue. The videos were later combined with the edited phrases which were merged to produce continuous dialogue. The recorded materials were edited and all wrongly produced sounds and or phrases were eliminated; only the correctly produced sounds were retained and were combined with the appropriate video recordings. The dialogues and consonants which were recorded are listed on Appendix 2.

After editing of the videos and audios the major task for the participants was then to listen to their own voices and imitate the sounds or phrases. For the phonetic experiment students would then compare their own pronunciation with the pronunciation they hear from the audios for the native speaker. Since this is a continuous process students were encouraged to keep the videos and audios so that whenever they forget the pronunciation they could refer to audio for pronunciation guide.

2.3 Recording

All the recordings were done in the Confucius Institute's language lab, which was a quiet environment. An Intel Core 3 Toshiba Satellite laptop and a new microphone were used for recording. AVS screen capture was used for all voice recordings. During the recording, students would imitate the teacher's pronunciation while reading the same sound or phrase written on the paper. Since the students could not read Chinese characters by the time of recording, the phrases were written both in pinyin and characters. A given tone, consonant, word or phrase would be repeated for several times until the student manages to produce the sound or phrase correctly or at least next to standard pronunciation. This was following the same practice method in the classroom but this time everything would be recorded in order to capture that moment when the student manages to produce the sound or phrase correctly. Recordings for phrases took a period of three days since there was need to repeat certain phrases for several times and also there was need to shoot the videos, while all the phonetic pronunciation recordings were done in one day only for all the people.

2.4 Editing

AVS Video Editor Software was used for editing the recordings. The researcher preferred to use this software instead of other popular video editors such as Adobe Premiere Elements, Ulead VideoStudio 9.0 Video Editor, Sony Vegas Movie Studio HD Platinum 10 Suite and so forth, mainly because AVS Video Editor is user friendly. It is not complicated, and it does not occupy too much space in the computer. Furthermore, the final video does not need to be reconverted into playable formats as in other software programs. Also AVS Video Editor Software can be downloaded for free. A simple editing process which required somebody who could differentiate between appropriate and inappropriate sounds was involved as described below;

2.5 Editing process

The first stage was to import the audio files to AVS Video editor and then drag the audio file to the sound editing column, where the audio file could be cut, separated and or mixed. This was an important stage because if wrong sounds were mixed this could have given the listeners an inappropriate point of reference during their pronunciation practice. Figures 1 and 2 below show wave sound before and after cutting during the editing process.

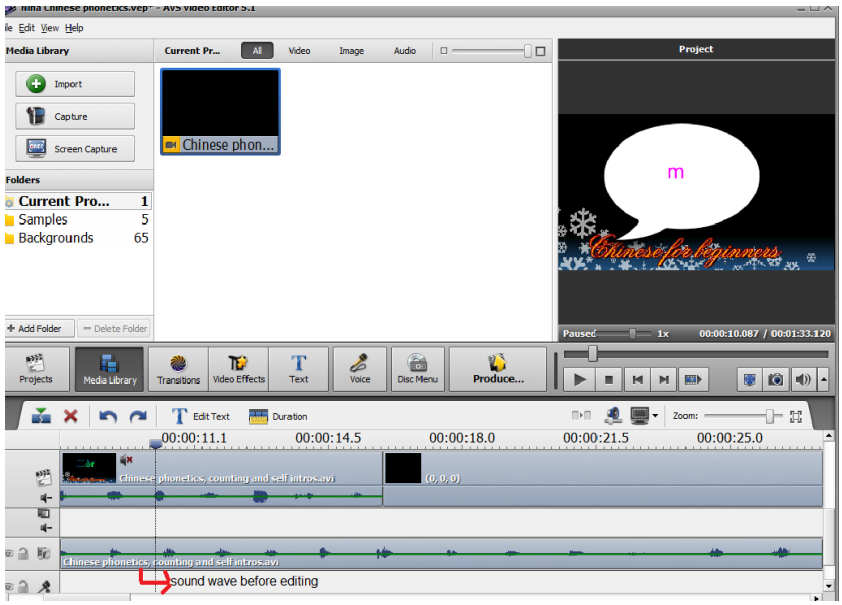

Figure 1 Wave sound before cutting of inappropriate sound [m]

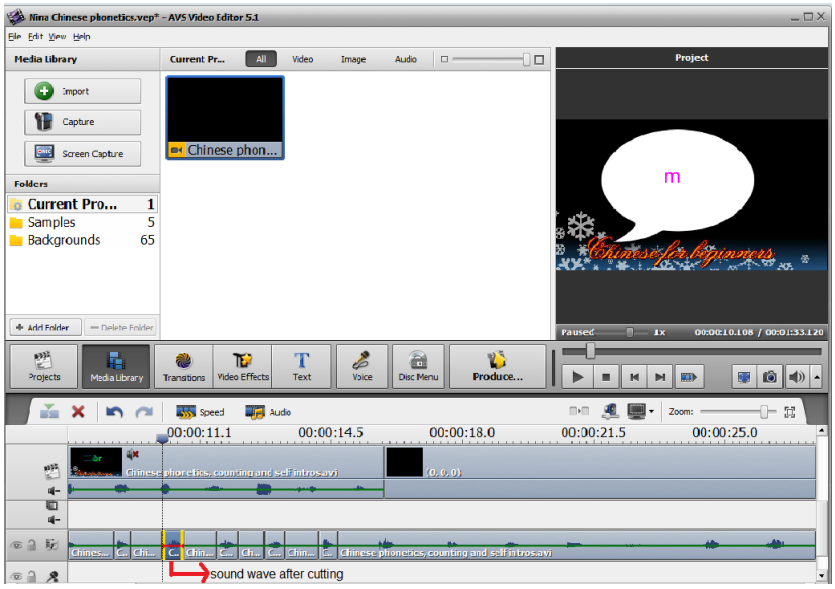

Figure 2 Wave sound after cutting of the inappropriate sound [m]

As can be seen above, subtitles were also added so that students could both listen and read out what they hear. After cutting as shown above; the inappropriate parts and wrongly produced sounds were deleted, the proper or fairly well produced sounds were then organized alternating with native speakers' pronunciation. For the Chinese lexical and semantic computer-aided practice the edited phrases were not alternating with native speakers' pronunciation so as to give an impression of fluent dialogue. Separate audios for the dialogues of native speakers were however made available for comparison and self-evaluation. The edited videos were then produced in AVI video format. The main advantage of the AVS Video Editor is that it allows production of videos in different

formats suitable for different video players as shown in the screen capture below taken during video production.

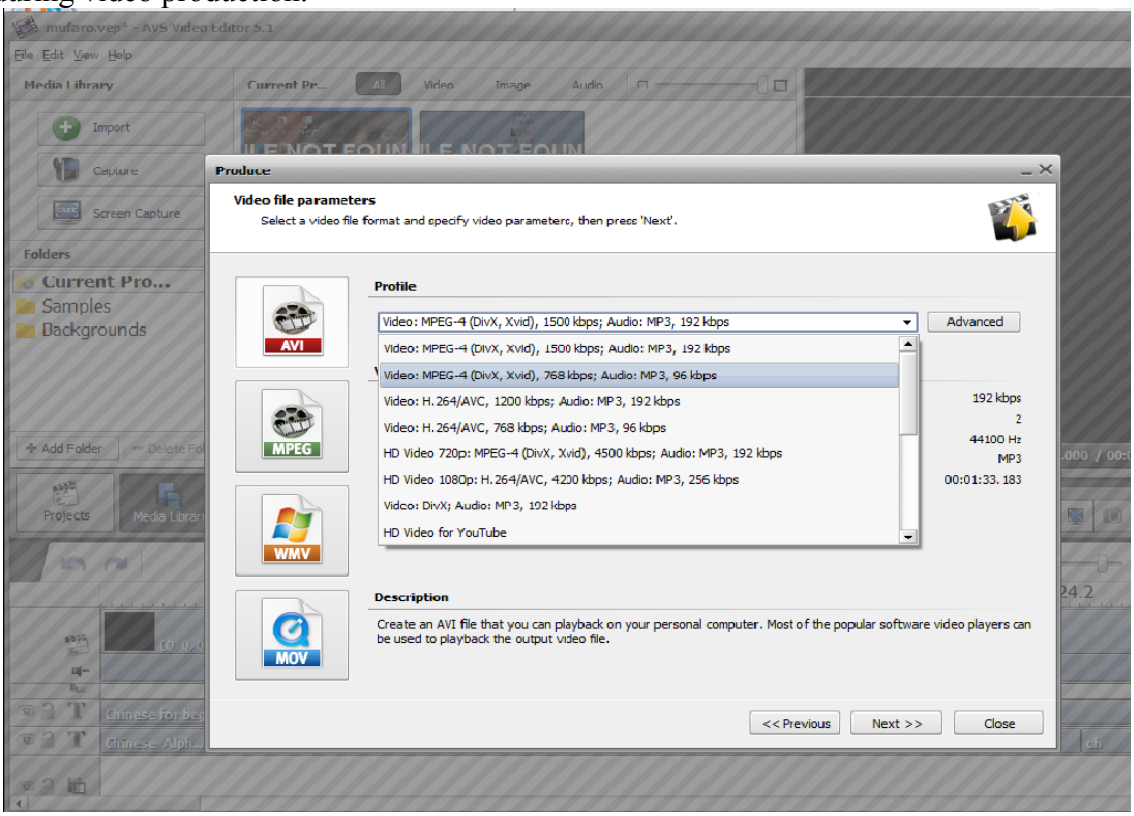

Figure 3 Video formats choice

Two videos for dialogues and two videos for the Chinese consonants and tones were produced and were later converted into mp3 format using some free video converter software programs. This was done to allow all students to have access to their own recordings; those who did not have computers to play the videos would play the audios on their own cell phones or any other mp3 players.

3. Experiment results and observations

The final videos and audios were distributed to participants who after listening to their own voices gave positive feedback. The experiment showed that participants were excited to hear themselves speaking fluent Chinese such that they would keep on playing the audios either on their cell phones or computers. Also it was observed that some participants were even playing these audios to their friends and or family members. Whether the participants were showing off or not it is assumed that by repeatedly playing the audios and videos this was a sign of motivation to learn Chinese, thus there was room for the students to improve their listening and pronunciation skills.

The experiment proved that the recording process is a method of pronunciation practice in itself. As the students follow teacher's pronunciation repeatedly they are in a

way practicing both pronunciation and listening. As observed from this experiment after recording some participants would spontaneously say out sounds, words or phrases they produced during the recording. This shows that the recording process leaves a profound impact on the participants' thoughts, feelings and attitudes towards the target language.

Apart from the above, the experiment also showed that students could imitate themselves better than they could imitate either the teacher or the voices of native speakers they hear from the Chinese audios. This was shown by the fact that the students could no longer forget their pronunciation as they used to do. Thus this showed that during the recording if a student is recorded while imitating the teacher and a next to native pronunciation is captured then student will be able to imitate what he or she hears and achieve better pronunciation.

The 2013 similar experiment which was used for those students who had problems in differentiating the Chinese language's second and third tone showed that students had improved their perception for the Chinese second and third tone hence after the computer assisted practice they could produce these two tones differently. Students were recorded before and after the computer assisted practice and audios were analyzed using Praat software. The Praat analysis followed a simple procedure where mp3 audios would be imported to Praat and annotated to text grid, thus producing a text grid file. Then by simultaneously selecting the original sound as well as the textgrid file and clicking the edit option a textgrid in picture form would then pop up showing tone structures in blue line. Below are the samples from four participants which show the Praat diagrams for Chinese second tone and third tone structures before and after the experiment.

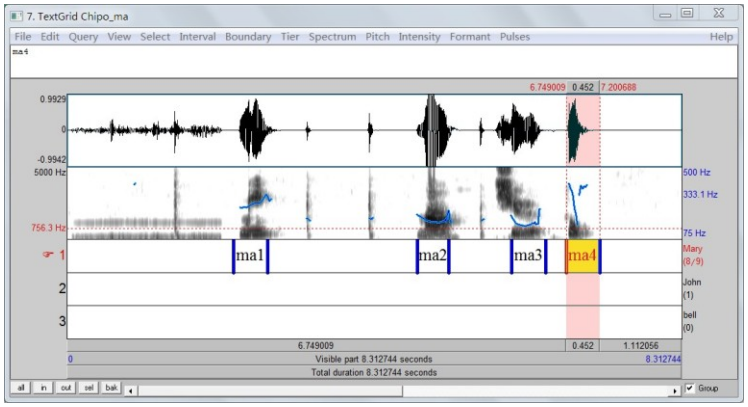

Figure 4 Student A, second and third tone before the experiment

This textgrid picture for the student A shows that the student was producing Chinese second and third tone both as a low slightly curving tone. In these graphs ma 2 represents second tone while ma3 represent third tone which were produced with the sound [ma]. The ma 1 and ma 4 which are not part of this analysis represent first tone and fourth tone respectively. In the textgrid picture above it can be seen that the blue lines above the slot ma2 and ma3 almost look the same. The Chinese second tone is a rising tone while the third tone is a curving tone also known as falling-rising tone (Olle Linge,

2011; Liu & Samuel, 2004). For the audios which were recorded before the computer-assisted tone practice these students could not discern the difference between these two tones as can be seen above and in other textgrid pictures below. After the computer-assisted tone practice the student was recorded again and below is the new tone structure for the student A.

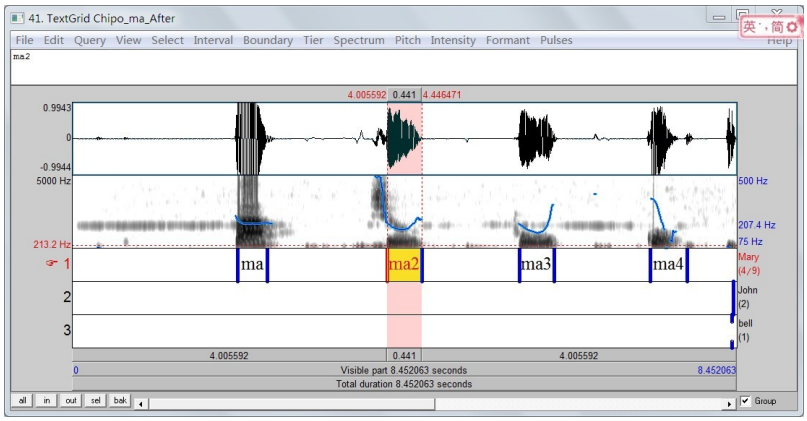

Figure 5 Student A, second and third tone after the experiment

After the computer assisted practice student A could distinguish ma2 and ma3 as can be seen from the above textgrid picture. The blue line above ma3 has a more pronounced curving shape different from that of ma2, showing that this time the student had better perception of these two tones. The same results were also observed for student B below.

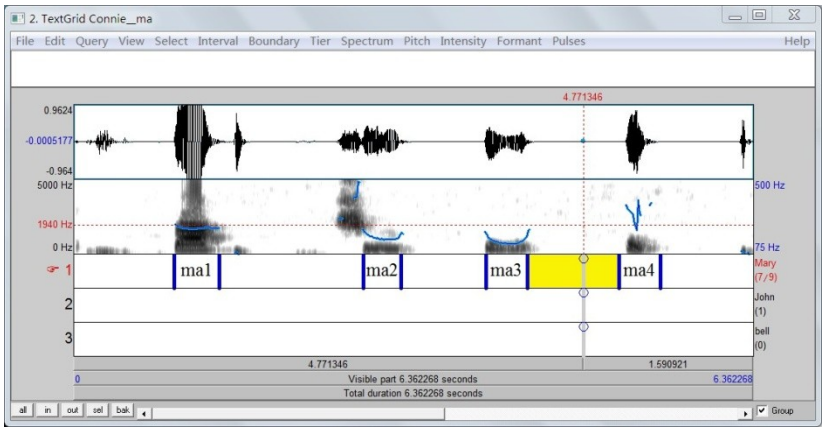

Figure 6 Student B, second and third tone before the experiment

Before the computer-assisted tone practice student B just like the student A was producing ma2 tone almost like ma3 tone both as low and slightly curving tones, but after the practice as can be observed from the textgrid picture below the student's ma2 was now a clear rising tone without any curving shape as before, the student's ma3 could now be differentiated from ma2.

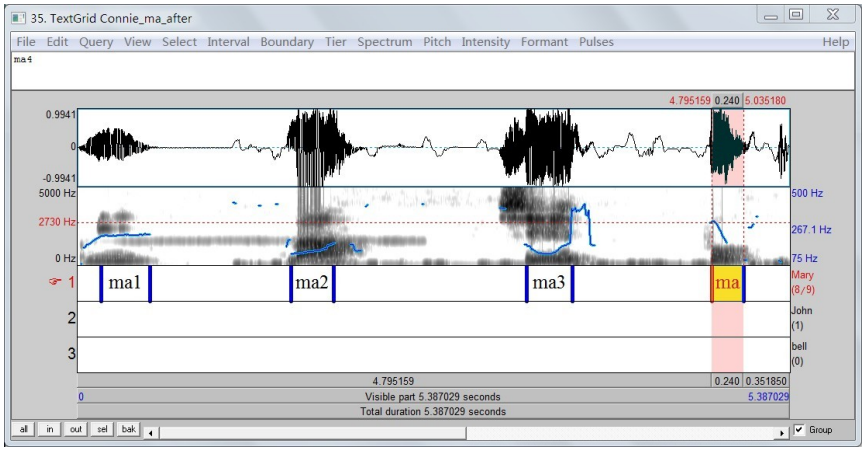

Figure 7 Student B, second and third tone after the experiment

In Figure 8 below just like in the previous cases of student A and B, before the practice student C produced the ma2 and ma3 tones as long low level tones with a slight rise at the end.

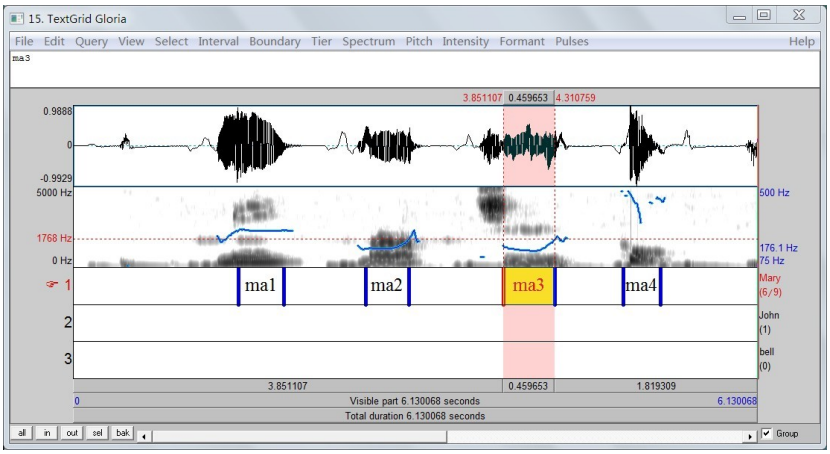

Figure 8 Student C, second and third tone before the experiment

However, after the computer-assisted tone practice the student C's ma2 tone was now a slightly rising tone which can be seen represented by the blue line above the slot labelled ma2, rising just below the red dotted line marked as 1299Hz at the left side and 201Hz at the right end of the picture. Above the ma3 slot the blue line shows a small curving line below the red dotted line as shown in Figure 9 below.

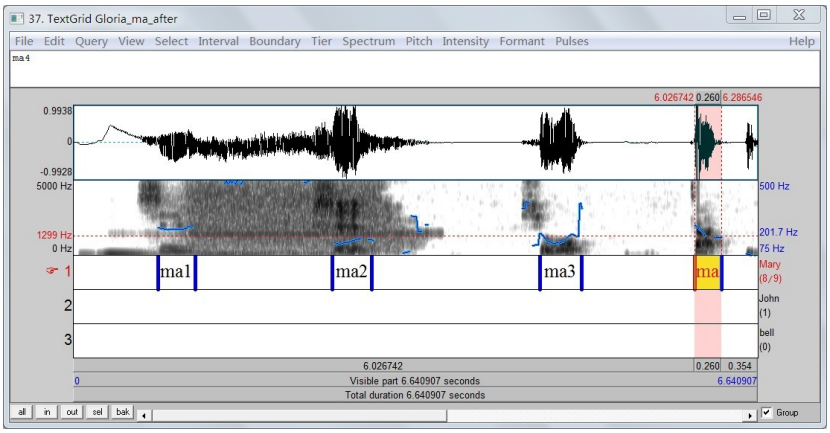

Figure 9 Student C, second and third tone after the experiment

Though the above student C's textgrid picture shows that the student's pronunciation of the Chinese second and third tone was not yet as perfect as it is supposed to be, but it should be noted that unlike before the practice there was now remarkable difference in this student's production of rising and curving tone. The last sample below also shows the same changes as in the above cases.

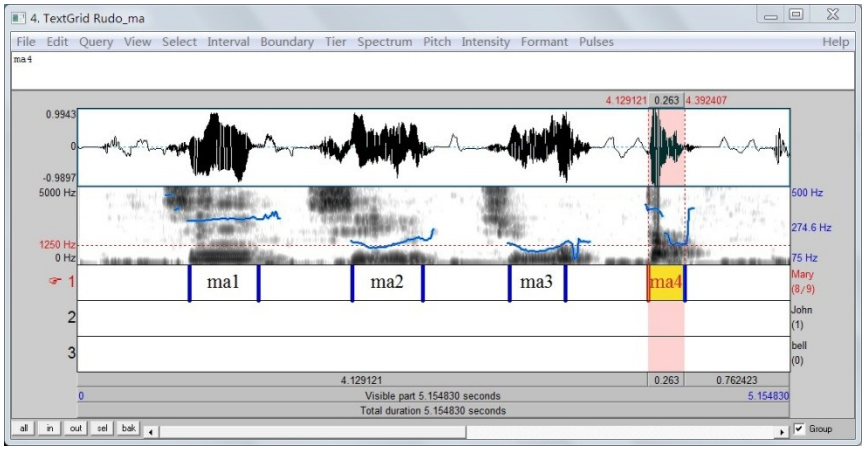

Figure 10 Student D, second and third tone before the experiment

Before the practice student D also could not differentiate between the second and third tone, as can be seen from the above textgrid the ma2 tone and the ma3 tone were looking alike, with a slight curve at the beginning and a long slightly rising end. After the practice it was completely different.

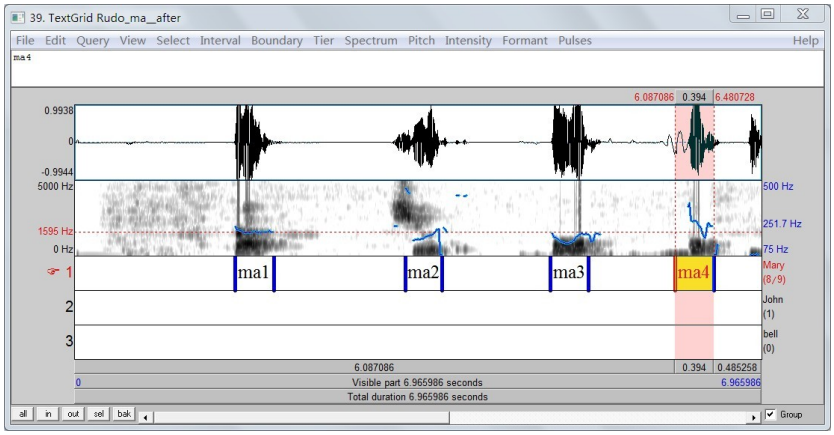

Figure 11 Student D, second and third tone after the experiment

Figure 11 above shows that ma2 unlike on Figure 10 was now rising slightly from below the line 1595Hz while ma3 was falling from the line 1595Hz to some point and then rising back again to 1595Hz, producing a clear curving tone. This suggests that after the computer-assisted tone practice Student D could now differentiate between second tone and third tone. Though this might not be the perfect Chinese third tone, it should be noted that in all the samples of these four students before the computer-assisted tone practice the students were not differentiating the second and third tone, but after this practice all of them were producing these two tones differently.

The above results of the experiment show that this computer-assisted practice method is a potential teaching and learning tool. The 2013 follow up experiment showed that it is possible to solve sound perception problems by giving students a chance to listen to their own pronunciation for a given sound. Below are some of the evaluations of this computer-assisted practice method.

3.1 Experiment evaluation

This experiment was evaluated based on what was observed after the experiment against the situation before the experiment. As already noted students had the problem of forgetting what they would have practiced and most of them could not differentiate between certain pairs of Chinese consonants such as b[p] and p[pʻ], zh[tʂ] and j[tɕ], ch[tʂʻ] and q[tɕʻ], sh[ʂ] and x[ɕ]; but after the experiment it was noted that participants were now able to produce some of these pairs differently without the teacher's guidance. During classroom practice there was a complete difference between the participants of the experiment and those students who had not participated. Those who did not participate in the experiment were still failing to differentiate between most of the above pairs. Those who participated in the lexical experiment could now use some of the words they had used during the experiment in other phrases. This was a sign that the practice method used had the potential to make students remember what they would have practiced. This was due to the fact that during recording the student repeats the imitated sound or phrase several times, and the correct pronunciation is retained so the student can refer back to the correct pronunciation if he or she forgets. In classroom activities we do

not keep the correct pronunciation for the students' future reference thus some students tend to forget what they would have practiced.

The Praat results in the second experiment also showed that after the experiment students were now able to differentiate between the second and third tone which they used to produce the same. Therefore, it can be argued that this computer-assisted practice does have the potential to improve students' perception of the sounds of a given target language.

The experiment was also evaluated through questionnaire method by Chinese language students as well as discussions by teachers in the Confucius Institute at the University of Zimbabwe. Some of the participants commented that they were shocked to hear themselves speaking fluent Chinese and could not believe that it was their voices. This suggests that editing of students' sounds and retaining the correctly produced sounds helped to show the students' potential. All students in this experiment had potential to speak Chinese well but they possibly did not know that until we captured the moments they could imitate the teacher well. Therefore, when they listened to their own voices in the audio they were "shocked" meaning to say they did not know that they can speak like that. Here we concluded that this was going to give students confidence that they can speak Chinese, it was going to give them hope that they will be able to achieve the same fluency they reached in the audio. Unlike in the classroom activities where students do not have a record of their potential, this computer assisted practice keeps student's "best moments" thus it keeps on reminding the student that he or she can make it.

In the questionnaire responses to question 4, students indicated that they were now able to discern the differences between zh[tʂ] and j[tɕ], ch[tʂʻ] and q[tɕʻ], sh[ʂ] and x[ɕ] which they used to feel like they were same sounds. This showed that the students had a new perception of these Chinese consonants.

While 100% of the questionnaire respondents showed that this method is a possible effective method for pronunciation practice, some Chinese language teachers argued that the method was likely to promote pronunciation errors which are directly caused by the students' mother tongue. However, considering that the pronunciation problems which were being experienced were mainly due to lack of motivation, the majority of teachers argued that this method was a crucial part of Chinese pronunciation practice outside the target language environment because it stimulates interest in the target language. Below are some of the motivational aspects, advantages and disadvantages of this computer-aided pronunciation practice.

3. 2 Motivational aspects of the experiment

The process had a two way motivational effect to the Chinese language students. Firstly, it was a direct motivational experience for the participants of the project. In the questionnaire response, some participants mentioned that they were able to produce some of the sounds they used not to be able to pronounce well, this was because they were now

imitating their own voices which they could hear and perceive better than when they were listening to the native speakers' voices.

Secondly, after the experiment the audios and videos were played for the other students who did not participate in the project. After watching the videos the students were asked to fill in a questionnaire. All the respondents of the questionnaires showed that they were now interested in participating in the next pronunciation practice. The aim was not to make the other students participate in the experiment but to show them how their colleagues could speak Chinese. It was observed that the reason why the other students were now willing to join in the project was mainly because they felt that the participants' spoken Chinese had improved. This could be defined as the "cheating effect". The truth is that their Chinese levels were still same at this moment only that due to editing, the recorded speech parts students' pronunciation was now sounding better than before. Therefore, other students were now eager to participate so that they can improve their pronunciation. In a way the other students who were now willing to participate in the experiment wanted to compete with those 8 participants. It should be noted that improved pronunciation is not an instant event, thus in this experiment we cannot prove that the experiment helped students to improve their pronunciation, rather it is assumed that since perception was the major problem then their pronunciation would subsequently improve too.

In this paper it is concluded that computer-aided pronunciation practice does not only help the students to practice their pronunciation but gives them assurance that they can achieve better pronunciation. Under strict teacher's guidance students can produce excellent pronunciations which in turn are the standard measurement of what the student can achieve. However, though there are many advantages for computer-assisted practice, the method has its own shortcomings as will be summarized below.

3.3 Advantages of the computer-assisted pronunciation practice

The process is entertaining, and it is not as serious as in the traditional classroom learning environment. However, this depends on the method used in recording. The video shooting method is more entertaining because it involves students enacting a short story in a given scenario. This is more like recreating the target language's environment. However, if students are not interested in acting they might find it tiresome, boring or childish.

The other advantage of this method is that, by allowing students to listen to their own voices while speaking a foreign sound it becomes clearer and easier to imitate. In other words the sound is made simple to perceive. In this case the sound is made simple to perceive in the sense that a foreign sound is turned into a local sound by the learner him or herself.

The other major advantage of computer-aided pronunciation practice is that it is affordable and easy to use hence it is appropriate for developing countries such as Zimbabwe. A one day workshop would be enough to train both teachers and students on

how to use the software to edit the sounds and produce audios and/or videos. Therefore, if this method is well implemented, any teacher even if he or she does not have sound or video editing knowledge can still use it as a teaching method.

3.4 Disadvantages of the computer-assisted phonetic practice

The whole process can be tiresome and time consuming if there are many students. For instance, in this experiment to record four students for lexical and semantic pronunciation experiment it took almost 3 days. Also the whole process still depends on the willingness of the students to participate. If the students are not willing to participate in the recording process then the effect of the whole process will fail.

3.5 Recommendations

From the results of this experiment it was revealed that this method is more effective and practical for the phonetic practice than lexical or semantic practice. This was shown by the fact that the recording and editing for lexical and semantic pronunciation experiment took three days while that for phonetics took one day. Due to the fact that for longer phrases both recording and editing requires more time and care, it is more tiresome thus it is not practical for daily learning practice. As shown from the results of the 2013 experiment where students who had pronunciation challenges in Chinese tones were engaged using this method and there was a clear improvement for those who were confusing second tone and third tone, it is recommended that for those students who might be having serious pronunciation problems for words and phrases this can be a good remedial activity.

4. Conclusions

This research shows that giving the language learner an opportunity to listen to his or her own voice while producing sounds for the target language is a helpful technique in learning a foreign language for it helps to improve perception of target language's new sounds through self-evaluation. Also, this computer-assisted practice can be a way of motivating language learners outside the target language environment. By capturing students' correct pronunciation, students are even able to forecast the level of fluency they can achieve thus giving them hope in learning the target language. The recording on its own is a way of preserving student's correct pronunciation thus when the student forgets the pronunciation he or she can still refer back to the audio and be able to imitate his own pronunciation. Apart from that, this computer-aided pronunciation practice is also affordable; the researcher suggests that language learners can use this practice method with even cheap and locally accessible resources. Instead of using expensive computers and editing software, a simple phone with a recorder can be used for recording and then compare the pronunciation of the recorded sounds with that of the native speakers. The objective is for the learner to feel the difference between his or her own pronunciation with that of the native speaker.

This research had a limited number of 16 participants only, thus it might be argued that the sample was not large enough to provide empirical evidence of what the experiment tries to prove. This was mainly due to the nature of students' studies at the University of Zimbabwe where students are always busy with other studies. However, the results from the first sample in 2012 and the second sample in 2013 shows that it is a worth trying method. It can be adopted as a foreign language learning and teaching technique. It is hoped that more extensive research projects will be carried out in the field of computer-assisted pronunciation practice so as to effectively utilize the ever growing Information and Communication Technology (ICT) in this digital literacy 21st century.

Acknowledgement: This work has been partly funded by the Confucius Institute at the University of Zimbabwe. Professor Mashiri (University of Zimbabwe) and Professor Liuxiu Yan (Renmin University) the Directors of Confucius Institute at the University of Zimbabwe and all the Confucius Institute lecturers also provided useful comments for this experiment.

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Appendix 1

Participants for the 2012 practice

Participants	Age group	Period of study at the time of recording	Experiment Item
A	19-25	3 months	Lexical practice
B	19-25	3 months	Lexical practice
C	19-25	3 months	Lexical practice
D	19-25	3 months	Lexical practice
E	19-25	3 months	Phonetic practice
F	19-25	3 months	Phonetic practice
G	19-25	3 months	Phonetic practice
H	19-25	3 months	Phonetic practice

Participants for the 2013 tone differentiation experiment

A	19-25	3 -5months	TONE DIFFERENTIATION
B	19-25	3 -5months	
C	19-25	3-5 months	
D	19-25	3-5 months	
E	19-25	3-5 months	
F	19-25	3-5 months	
G	19-25	3 -5months	
H	19-25	3-5 months	

Appendix 2

Recordings

Recorded Chinese phonetic sounds	
E-H	
consonants	Tones
bo po mo fo, da ta na la, ga ka ha, ji qi xi, zhi chi shi ri, zi ci si	First tone mā Second tone má Third tone mǎ Fourth Tone mà

Recorded dialogue and Participants:	
Phrases for the first pair	Phrases for the second pair
A: 你是学生吗？nǐ shì xué shēng ma ？ B: 是，我是学生。Shì, wǒ shì xué shēng. A: 你是哪个大学的学生？nǐ shì nǎ gè dà xué de xué shēng? B: 我是津巴布韦大学的学生？wǒ shì jīn bā bù wéi dà xué de xué shēng? A: 你的专业是什么？nǐ de zhuān yè shì shén me? B: 我的专业是语言学，你呢？wǒ de zhuān yè shì yǔ yán xué, nǐ ne? A: 我的专业是汉语。 你住在哪？wǒ de zhuān yè shì hàn yǔ. nǐ zhù zài nǎ? B: 我住在 Kuwadzana，你呢？wǒ zhù zài Kuwadzana, nǐ ne? A: 我住在乐山 wǒ zhù zài lè shān. B: 乐山是什么？lè shān shì shén me? A: 乐山是 Mt Pleasant。 Lè shān shì Mt Pleasant. B: 知道了，谢谢。zhī dàole, xiè xiè. A：不客气 bú kè qì.	A：喂，你好 wèi, nǐ hǎo. B： 喂， 你找谁？ wèi, nǐ zhǎo shuí? A：Tatenda 在家吗？Tatenda zài jiā ma? B：我就是 wǒ jiù shì. A：是吗？ 我好想你。shì ma？ wǒ hǎo xiǎng nǐ. B：我也是 wǒ yě shì. A：你什么时候来我家？nǐ shén me shí hòu lái wǒ jiā? B 今天下午 jīn tiān xià wǔ. A：好吧，下午见 hǎo ba, xià wǔ jiàn. B：一会儿见。yìhuìr jiàn.

Appendix 3

Questionnaire sample

Computer-aided Chinese Language phonetic practice Questionnaire
汉语计算机辅助的发音练习调查表

DATE 日期：_____Age 年龄:_____
INSTITUTION 机构:_____

1. What is your Chinese proficiency level? 你的汉语水平是几级？_____
2. How long have you been studying Chinese? 你学了汉语多长时间？_____
3. What made you did you participate in this project？ If you didn't participate would you participate in such activities next time? Why? 如果你参加了，你为什么参加了？如果你没参加，下次你会参加吗？为什么？
   _____
   _____
4. Did you learn something from the roles you played? Or after watching the videos did you learn something? 通过这次的汉语表演活动你学到了什么？看这些视频之后你觉得对你的汉语水平有收获吗？_____
   _____
   _____
5. Do you think such pronunciation practices are useful to Chinese language students? 你觉得这样的汉语发音练习对学生有用吗？_____
   _____
   _____
   _____
6. Do you think teachers should use such pronunciation teaching methods? 你觉得老师可以用这样的方法来教汉语发音吗?_____
   _____
   _____

ANY OTHER COMMENTS 其他意见：
_____
_____

Please don't write your name, this questionnaire is for academic purposes, whatever information you contribute, shall be used towards the development of teaching and learning of Chinese language.
Thank you for your contribution.

Blackboard Learn 平台上初级汉语网上课程的实践与探索 (Practice and exploration of the *Blackboard Learn* platform in teaching Chinese online for beginners)

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摘要：Blackboard Learn™是一个集线上教学、团体建设、内容管理和绩效评估为一体的综合网络课程管理平台。这一平台因其在满足学习者学习需求上的灵活多样和功能上的丰富便捷成为网络课程通常采用的一个热门平台。以高中两个学期的初级汉语网络课程为例，本文着重讨论 Blackboard Learn 平台下的初级汉语网络课程的结构设计、内容管理、任务构建和评估测试，具体说明 Blackboard Learn 系统中的多项功能，如：评估标准的设定和实施、标准与内容的对应衔接、学生学习进程的监测管理、同步和异步工具的使用、Wikis, Blogs 和 WebEx 与 Blackboard Learn 系统的整合等。本文将根据过去五年教学实践所积累的资料，分析初级汉语网络教学的成果与挑战，并讨论这一教学实践给网络教学法和网络课堂互动带来的启示。

Abstract: Blackboard Learn™ is a comprehensive online platform for teaching, learning, community building, content management, and outcomes assessment. Its flexibility, versatility, and capability to meet online learners' growing needs have made it a popular platform for online language teaching. Taking a two-semester Chinese for beginners course series as a case study, this paper features the design, content management, task construction, and assessment of Chinese language online course under the Blackboard system. The practice and effectiveness of Blackboard features essential to Chinese language online teaching, including creating and grading interactive rubrics, associating rubrics with contents, incorporating digital learning objects, aligning lessons to language proficiency standards, monitoring at-risk students, integrating synchronous/asynchronous tools, and using Wikis, Blogs, WebEx within Bb, etc., will be discussed using longitude data from the offerings of this series for the past 5 years. Challenges and solutions regarding teaching Chinese online for beginners will also addressed.

关键词：网络学习管理平台、Blackboard、网络课程、初级汉语

Keywords： Web-based study management, Blackboard, online course, Chinese for beginners

1. 引言

近年来，随着网络科技的迅猛发展和进步，以网络为平台的课程教学在美国高等院校迅速增长。根据 Allen 和 Seaman（2014）的调查统计，截至到 2013 年美国高校大学生至少选上一门网络课程的人数已经超过 710 万，增幅为 6.1%。虽然这一增幅在高校范围内比前期有所下降，但仍然代表着超过 40 万学生人次的增长，并继续大大超越大学生总体入学率的增长。与此相呼应，网络课程在中小学范围内也得到延伸和发展。据 Picciano 和 Seaman（2010）的统计报告，在 2009 年全美高中学生至少选上一门网络课程的人数已达 103 万，占全国高中生总数的 2%。据同一报告预测，到 2016 年，这一人数将达到 500 万。

网络课程在高中教育领域发展的主要原因在于其授课形式能够适应高中教育的多层次需要，弥补面对面传统课堂在满足不同学生需求方面的不足。网络课程在提供美国大学预修课程、开发区别性和个性化课程、延伸和补充传统面对面课程、为学生创造重新获取学分机会等方面展示了广阔的前景（Picciano & Seaman, 2010）。此外，网络课程在充分利用和共享教师与课程资源、打破传统课堂局限、扩大学生受众范围、提供可供选择的即时学习等方面的优势，也是其在高中教育领域迅速发展的动因。

具体到外语教学领域，Godwin-Jones（1999）将网络课程的优势归纳为：增加综合性的接触真实语言的机会、创造具有互动性和吸引力的学习环境、提供灵活多样的语言操练机会。网络课程的这些优势，尤其是在扩大学习者接触真实目的语方面的长处使其在中高级外语教学阶段的应用效果更加明显，也使针对于中高级阶段的网络课程的开发与研究相对集中。相比而言，初级阶段的网络课程的设计与开发则较多地关注局部、单项的语言技能和语言点，如阅读技巧和策略（Kost, 1999）、词汇习得（Kost, Foss, & Lenzini, 1999）等。虽然现有的这些研究从不同方面在一定程度上揭示了网络课程在初级阶段的有效性，但从一门完整网络课程的角度的实践和研究还尚待深入。

本文将首先通过回顾已有研究对网络课堂环境下教与学过程的描述和定位，展示网络课堂的独特个性。接下来以夏威夷州教育部下属的E-School面向初高中学生的“一年级第一学期中文”（Chinese 1A）和“一年级第二学期中文”（Chinese 1B）为例，首先介绍、分析Blackboard学习管理系统为初级汉语课程提供的课程框架、功能选项和技术支持，然后着重探讨初级入门阶段汉语“完整网络课程”（complete online）的教学设计、实施、效果以及面临的挑战。最后讨论这一教学实践给网络教学法和网络课堂互动带来的启示。

2. 网络环境下的教与学

网络课程的构建并不是对传统面对面版本课程的简单移植，而是需要经历教学法上的根本性的改变和对师生教与学关系的重新认识（Coopman, 2009）。Brent（2005）将网络课程中的教与学的过程比作“表现”（performance）和“文本化”

（textualization）。从“表现”的角度来看，知识的传达与获取在网络课程的环境下已不仅仅局限于教师传达，学生接受这样单一的线性模式，而是成为涉及到教师、学生和教学内容三者之间的立体性的互交过程，而网络学习管理系统中的技术功能则为实现这一互交过程提供了可能。有别于“表现”，“文本化”（textualization）指的是将完成某一任务的步骤整理记录在案，成为后继者掌握完成同样任务技能的蓝本。“文本化”的结果实际上是由实际动手经验转译而来的一系列明确的、可遵循的静态的步骤。手册性质的传统课本可以看成是这一蓝本的一个具体的例子。而网络教学平台在技术功能上的发展则为更多类型的工作和任务的文本化提供了支持。

尽管“表现”和“文本”似乎反映了传统教法与技术革新上的矛盾，但就初级语言课程来说，在强调教师与学生、学生与学生间的互动交际的同时，“文本”所代表的机械训练和语言输入同样是不可忽视的一环。网络课堂在对“互动”与“文本”的兼容上所体现的灵活性奠定了其在初级语言课程上的应用基础。

3. Blackboard Learn ™ 课程管理平台及其主要功能

Blackboard Learn ™ 是由位于华盛顿特区的Blackboard Inc 公司推出的集“课程教学”、“在线交流”和“评估测试”为一体的在线学习内容管理系统（Web-based Learning Content Management System (LCMS)。尽管其它课程管理系统（如Angel/LMS, eCollege, GNU General Public License/Linux等）和开放源代码的Sakai Project、Open Source和Moodle分占了部分市场，但Blackboard始终占领着主导市场，特别是自2006年与当时主要对手WebCT合并以后，Blackboard在课程管理系统市场上的使用率超过了80% （Bradford，Porciello，Balko and Backus, 2007）。根据Blackboard官方网站提供的数据，截止到2014年在北美选用此平台的高等院校已超过2700所，K-12学校高达4200家，用于政府、企业和军队专用培训项目也多于1200家。

Trotter（2008）引述伊利诺伊州立大学的报告指出：对于普通的在线学习内容管理系统，下列的基本功能似乎应该是不可缺少的：通知 （Announcements）、日历 （Calendar）、成绩簿（Grade book）、异步讨论区（Asynchronous discussion boards）、同步聊天室（Synchronous chat room）、课堂内与课堂外的电子邮箱（E-mailing (internal) and/or external accounts）、在线日记（Online journal）、白板（Whiteboard）、多媒体资源分享（Document sharing, including digital pictures, audio, and streaming video）、单元及学期测试、问卷和测试（Quiz, test, and survey options）、使用者活动统计报告（User-activity reports）等。至于如何组织和整合以上基本功能，不同的系统则可能采取不同的方式。

下面以 Blackboard Learn 9.1 SP12 为例，说明 Blackboard Learn 的机构框架以及针对语言教学的功能选项。

Blackboard 的课程结构是以等级系联关系（Level）的方式组织构成的。整个课程的初始级菜单可以简单二分为“课程内容”（Course Content）和“课程管理”（Course Management System）。在“课程内容”下、初始设定包括的具体工具程式有：课程引导首页（Homepage）、 课程信息（Information）、 内容（Content）、讨论（Discussion）、 小组（Groups）、工具 （Tools）、 帮助（Help）以及网络链接（WebLink）等。在“课程管理系统”，即控制台下，初始设定的工具包括：内容整合管理（Content Collection）、课程工具 （Course Tool）、成绩中心（Grade Center）、用户与小组 （Users and Groups）、打包工具（Packages and Utilities）和帮助（Help）。

Blackboard 对所有工具程式的简单二分只是对具体工具选项的初始分类，为进一步再分类提供基础。在具体课程的构建中，Blackboard 允许课程设计者选择定制课程结构和自由组合具体应用工具。例如，根据课程的整体需要和具体工具的特性与用途，一级菜单通过重新定制可以细分为：课程普通信息（General Course Business）、课程内容（Content Area）、课程工具（Course Tools）、课程资源（Course Resources）和教师控制板（Control Panel）。在各个分项的标题下，可以进一步生成下一级菜单，集和相关的具体应用程式。例如：

- 课程普通信息（General Course Business）中可以包括：课程信息（course information）、班级会议室（Homeroom）、布告栏（Announcement）等。
- 课程内容（Content Area）中可以包括：欢迎（Welcome）、开始（Getting started）、具体的学习单元（Study Unit）等。
- 课程工具（Course Tools）中可以包括：讨论台（Discussion Board）、我的成绩（My Grades）、虚拟课堂（Virtual Classroom）、电子邮箱（Messages）等。
- 课程资源（Course Resource）中可以为学习者提供学习及扩展资源的网页、应用程式、外部链接等。
- 教师控制板（Control Panel）用于开发和管理整个课程。包括在教师控制台下的具体的二级管理平台有：内容管理（Content Areas）、 课程工具管理（Course Tools）、 课程选择（ Course Options）、 用户管理（User Management）、 测试评估（Assessment） 和查询帮助（Help）等。

在以上所列工具中，“课程内容”、“在线活动工具”以及“测试工具”是Blackboard学习管理系统课程的核心应用工具。表一列举了课程内容区域内主要工具程式及其用途。

表一：内容区域内主要工具程式及其用途

工具程式		主要用途
	学习模块（Learning Module）	作为系统默认的学习单元模块，学习模板主要用于构建学习单元，整合单元内初始级和下级单位的学习内容。模板内可以容纳呈现学习内容的网页，包括多媒体网页、讨论板、日记、博客、Wikis、测试等。

	内容文件夹 （Content Folder）	内容文件夹用于组织各种教学内容，以文件内容列表形式呈现给学习者。学习者可以循列表目录链接，选择展示学习内容的页面。HTML的编辑功能可以在页面和链接之间添加说明、功能介绍等。
	项目（Item）	项目为具有HTML编辑能力，功能最为多样化的网页(Web page)，具有可以呈现文字材料、添加图片和视频、允许链接第三方网页、添加附加文件等功能。
	空白网页（Blank Page）	与项目（Item）的功能大致相同，但局限于单一网页的呈现，不具备链接下一级单位内容的功能，便于直接展示简洁明了的网页内容。
	文件（File）	主要用于链接可展示或下载的文档。可在新开启的窗口中展示文档及图片。
	音频（Audio）	用于播放多种形式的录音音频。格式包括： aiff, .asf, .moov, .mov, .mp, .wav, .wma, .wmv.等。
	图片（Image）	用于展示各种格式的图片。格式包括：gif, jif, jpg, jpeg, png, tiff, and wmf等。
	视频（Video）	用于播放视频。文件格式包括： MPEG/AVI、 Quick Time、 Flash/Shockwave等。
	课程链接（Class Link）	通过此链接连接课程内位于其他层级或位置上的任何工具程式、项目、文件等。

“在线活动工具”为学习者提供按照课程大纲探索各个单元学习内容的学习活动。表二举例说明Blackboard课程工具区域内主要工具程式及其用途。

表二：工具区域内主要工具程式及其用途

工具程式		主要用途
	讨论区 （Discussion Board）	非同步在线讨论活动平台。由教师在讨论区内张贴讨论题目，学生对题目提供自己的观点、看法和反馈，并能阅读其他同学的回应，通过跟帖的形式做出评价和回应，激发深入互动和讨论。
	博客（Blog）	非同步的学生公开表达自我的平台。学生在此可以公开分享个人信息，记录个人经历和思想。同学可在阅读后加入提问和评论，展开互动。
	维基（Wiki）	学习者在此通过彼此互动协作完成某一指定任务。允许学生共同生成、加工和修改同一个文件，以集体作者的形式完成并提交单一的文件。
	日记（Journal）	相当于非公开性博客。教师可以要求学生就某一题目进行记录和反思，学生根据老师反馈进行修改，教师可对完成稿评分。日记内容一般只与老师分享，但也可以选择与同学分享。
	VoiceThread	Blackboard支持在系统内添加VocieThread的应用程序。VoiceThread可以整合图片、音频、视频、word或powerpoint文档等媒介，并以演讲者和听众对话形式呈现。VoiceThread同时允许多作者协作生成文档。

	WebEx	Blackboard支持在系统内添加WebEx面对面同步虚拟课堂。虚拟课堂允许教师与学生同时在线交流，使用多边即时音频、视频分享应用程序，赋予教师提供非同步在线课堂所缺乏的师生即时互动交流的能力。WebEx同时具有记录交流过程，支持下线回放的功能。

学习评估和测试是任何课堂教学不可缺少的环节。Blackboard 提供了两种由教师评估测试的工具程式，即“作业”（Assignment）和“测试”（Test）。

表三：评估测试工具与应用途径

工具程式		主要用途
	作业（Assignment）	使学生提交在线文本作业或上传先期完成的独立文件，如Word文档，Powerpoint （PPT） 文件，音频或视频文件等。教师可提供作业的布置说明、公布具体要求和评分标准（Rubric）、提供在线或附件形式的反馈。评分直接导入学生成绩簿，使成绩簿即时同步更新。
	测试（Test）	为教师提供设计和管理测试的工具。测试形式包括：多项选择、正确与错误（T/F）、简答题等。所有题目储存在系统内的分类数据库，可以在同一课程或不同课程中循环使用。测试通过设定可以允许学生重复提交。教师可选择性地提供反馈和显示正确答案。

4. Chinese 1A 和 Chinese 1B课程内容

Chinese 1A和Chinese 1B是由FuelEducation（http://www.getfueled.com/）在其前身Aventa Learning by K[12]的同名课程基础上推出的供美国初中或高中使用的“一年级第一学期中文”（Chinese 1A）和“一年级第二学期中文” (Chinese 1B) 教程 。这套中文网络教材以美国教育部K-12州立教学标准（State Standards）为基础，围绕ACTFL标准中五个C（Communication“交流”，Communities“社区”，Cultures“文化”，Comparisons“对比”and Connection“联系”）的原则，通过听、说、读、写和文化训练培养学生初级中文的交际能力。作为以初、高中学生为对象的中文教学内容蓝本，这套多媒体中文教学材料为K-12学校独立的网络课程的构建提供可以选择并允许自行定制的教学资源，具有相当于纸质课本对应于传统课堂的作用。

这套可供使用一学年的教学材料分为两个学期，每个学期各有五个单元，外加一个期末考试单元，全年共计十二个单元。第一个学期由以下五个单元组成：Chinese （中文）、Greetings （问候）、Calendar （日期）、Weather（天气）和Time（时间）。第二学期的五个单元涵盖 Places（地方）、Family （家庭）、Food （食物）、Activities （活动）和 School （学校）。整个课程通过各种在线活动使学生获得听、说、读、写作的基本能力以及相关的文化知识。每个单元围绕所定专题提供词汇、语法、表达、文化背景等学习模块、操练组件、作业练习和测试评估等项目。学习、操练、作业、测试等模块利用各种多媒体工具实现，包括Avaters、Flash 模拟互动 (Flash simulators)、音频、视频等。

表四：Chinese 1A 课程内容

单元	专题内容	文化要点
Unit 1 Chinese （中文）	• get some ideas about the Chinese language （汉语概述） • learn how to write in Chinese （汉字书写） • learn how to type Chinese （汉字的电脑输入） • learn the Chinese Phonological System-Pinyin: Initials, Finals and Tones. （拼音系统：声母、韵母和声调）	a broad view of china （中国概述）
Unit 2 Greetings （问候）	• introduce yourself to someone and ask their name （ 自我介绍与和询问别人的姓名） • ask how someone is （问候别人怎么样） • ask where someone lives（询问生活的地方） • inquire some basic information of others in real conversations （询问别人的基本信息） • use appropriate basic vocabulary for greeting people at different times of day （适用不同场合的问候词汇） • choose a farewell appropriate in various situations（适用不同场合的告别用语） • begin to learn about the complex nature of language （汉语句子的复杂性）	investigate the Chinese tea culture （中国茶文化）
Unit 3 Calendar （日历）	• talk about the day of the week（星期的表达） • learn the numbers 0-31（数字 0-31） • talk about the date （日期） • talk about what things you like to do on different days（谈不同日子的活动） • talk about your birthday（谈生日）	several important cultural aspects of china （中国文化要点）
Unit 4 Weather （天气）	• talk about the weather （谈天气） • talk about the seasons（谈季节） • convert degrees from the Fahrenheit scale to Centigrade and vice versa（华氏度与摄氏度的转换） • express possession（“所有”的表达方式） • learn some verbs（学习几个动词） • talk about what you wear in various situations（不同场合的穿着） • learn colors 颜色词	learn about Beijing; geography and climate of china （北京以及中国的地理和气候）
Unit 5 Time （时间）	• talk about places in a town （城市中的不同地方） • talk about things to do in school（学校活动） • talk about things you do at different places in a town（谈城市中不同地方的活动） • manipulate some verbs（动词的应用） • learn about time（时间的表达）	learn about Shanghai and Chinese architecture (上海与中国的建筑)

表五：Chinese 1B 课程内容

单元	专题内容	文化要点
Unit 6 Places （地方）	• talk about your city or town （谈论你的城市） • talk about additional stores or places in your town （你的城市的商店和其他地方） • describe where things are in relation to other things in your town （你的城市的内部关系） • talk about things you do, like to do, need to do, want to do or have to do（谈喜欢、想要、需要、得要做的事情）	Research and gather information about Hong Kong; understand more about cities in China （香港专题研究

	• learn choices in questions （选择问句） • learn how to express present and past tense in Chinese （现在和过去的表达）	与更多了解中国的城市）
Unit 7 Family （家庭）	• talk about your family members （谈家庭成员） • talk about your family members birthdays and ages（谈家人的生日和年龄） • review dates and numbers （复习日期和时间）	investigate cultural practices in Chinese families （中国的家庭习俗）
Unit 8 Food （食物）	• talk about foods （谈食物） • talk about beverage （谈饮料） • talk about meals （谈吃饭） • learn to order food and converse in a restaurant （点菜和餐馆用语）	dining habits in the Chinese speaking world （饮食用餐习惯）
Unit9 Activates （活动）	• talk about sports and leisure time activities in the China （中国的运动与休闲活动） • learn how to talk about what you like to do（谈喜欢做的事情） • learn how to invite other people （邀请客人）	accept and refuse an invitation （接受与拒绝邀请）
Unit 10 School （学校）	• talk about schools and school activities in China （中国学校与学校活动） • learn to talk about your school day in more detail （具体谈论学校生活） • learn to talk about your house（你的家）	chores and responsibilities you have at home （家务与家庭的责任）

具体到各个单元，其内部结构大致由以下部分构成：专题介绍、核心内容（再分为三个部分）、文化沙龙和参考词典。

专题介绍（Introduction）部分提供本单元的主题内容简介、单元目标、学习任务概览等。

核心内容一般又再分为为三个部分。每个部分侧重专题的一个方面，三个部分彼此衔接，通过扩展、递进和补充形成一个完整的单元。每个部分由三到五个数量不等的模块组件构成，涵盖课文多媒体演示、词汇、语法、语用、阅读、文化背景知识等输入和操练，并提供小组互动讨论、口语与书写产出性功课（Assignment）、专项任务（Project）等深度互动活动平台。

每个部分的首页为主课文展示。主课文多以主题对话形式出现，依靠多媒体 Flash 幻灯片（Slideshow presentation）演示对话的文字稿及拼音，配以插画图片，通过点击发声，赋予学习者操控对话进行速度、反复聆听模仿的权限。词汇模块由以下多种形式呈现：（1）包含新词语的单句和语段的汉字形式，配与相应的图画，并辅以 Flash Player 支持的点击发声学习功能；（2）词语语义关系图（Word Association Map），同时附有可点击发声功能；（3）传统的单词列表，生词以汉字、拼音和英语释义顺序列出；（4）生词练习以汉字与拼音匹配、声音与汉字匹配、汉字与意义匹配等形式，通过 Flash 的拖拉归类功能实现；（5）生词认读自测，展示生词的汉字形式，自我测试后点击显示拼音和释义进行对照核实；（5）多向参考词典: 单词以英汉和汉语双解词典形式列出，并附有典型例句，以备查询。

语法模块由讲解和练习两个部分组成。语法讲解以传统网页形式呈现。语法点的练习涉及到多个层面，包括词组、短语、句群、段落等，呈现形式有列表翻译、机械性问答（Drill）、对应匹配等。

阅读模块由阅读短文、语法注释、生词列表、阅读理解问题等部分组成。阅读短文、语法注释和生词以传统网页形式呈现。阅读理解问题以学生口头回答，点击查看答案，自行对照形式进行。

文化背景知识由英文介绍，学生读后完成指定的小组讨论。参考词典为学生提供本单元出现的生词的快速查询帮助，包括英汉、汉英以及反映重点用法的例句。

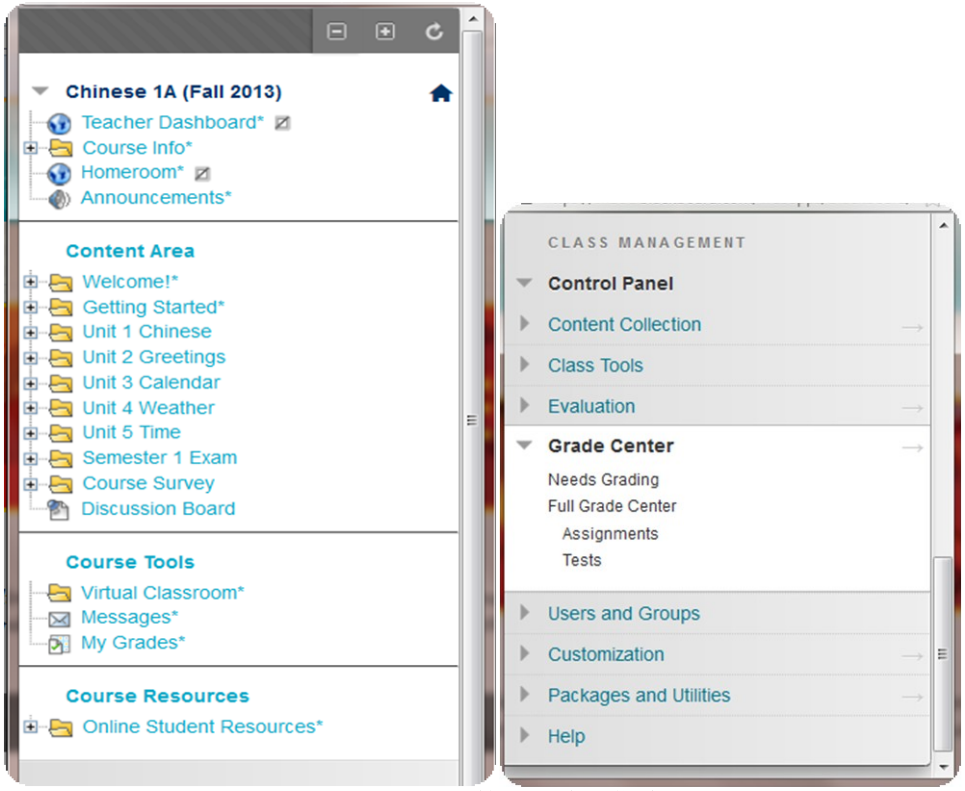
配合输入性学习模块，深度互动与操练活动平台包括：产出性小组互动讨论、口语与书写产出性功课（Assignment）、小组讨论（Discussion）、专项任务（Project）、小测验（Quiz）、单元考试（Unit Exam）等。

5. 课程内容与Blackboard Learn 的整合

如同在传统课堂的教学中，选定课本后，还需进行具体课堂教学的设计和材料取舍才能进入教学实施过程。对于网络课程来说，确定教程蓝本后，需要根据所选用的网络课程管理平台的结构特点对教程内容进行必要的加工和调整，使内容与管理平台相互匹配，实现课程内容在管理平台上的恰当呈现和课程的有效运行。

Blackboard Learn 9.1 SP12版的推介中将这一版本的更新理念归纳为：为学习者打造简捷、精良的学习过程，创造高效的学习经验；提供充分展示多样化学习内容的平台，为学习者创造广泛接触学习内容的机会；提升教师网络教学的实际效果；推动课程内小组社团的协作学习；方便教学内容的分享和管理以及实现高效率的学习成果评估和测试（Blackboard，2012）。在实现课程内容与管理平台的整合过程中，课程设计者需要充分了解管理平台的功能性设计理念，将如何彰显课程平台的设计理念，发挥各种教学工具的功效，合理展现课程内容，最大限度地达成教学目标、保证学习效果作为整合的根本原则。

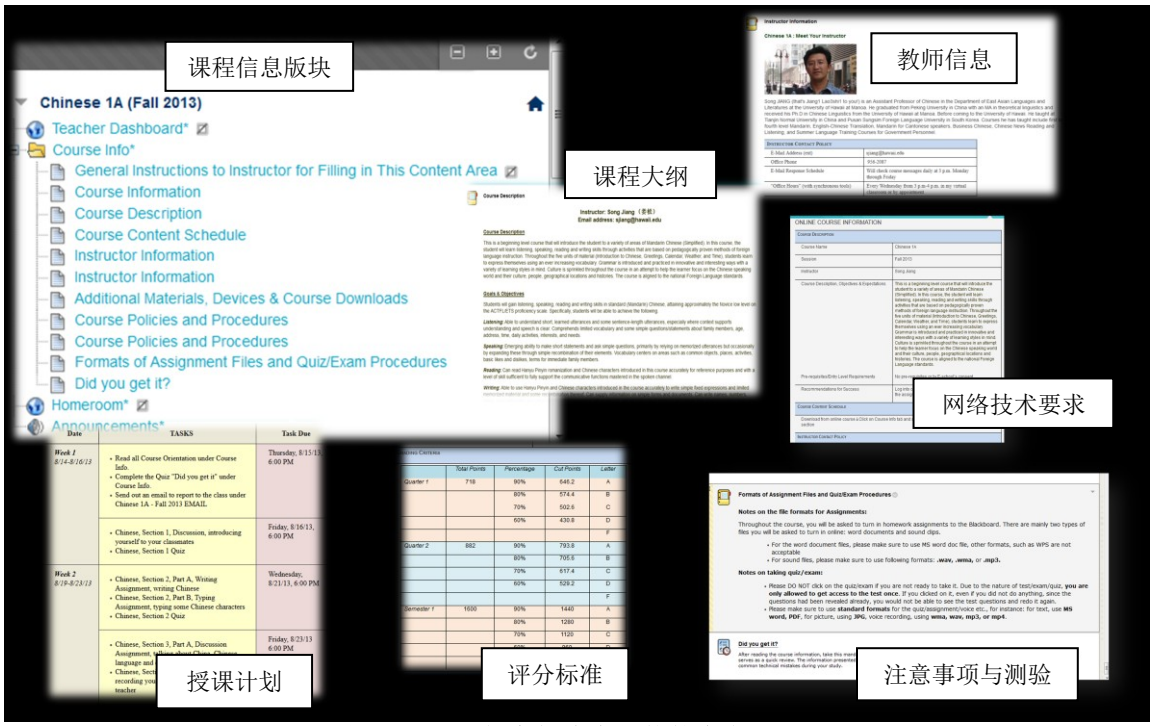
按照Blackboard本身提供的课程管理框架，本课程在总体结构上分为以下五个部分：（1）课程信息（Chinese 1A或者Chinese 1B）用于发布课程普通信息、功课提醒、通知等；（2）课程内容（Content Area）包括具体的学习单元；（3）课程工具（Course Tools）提供讨论台、成绩查询、虚拟课堂、课内电子邮箱等；（4）课程资源（Course Resources）为学习者提供学习及扩展资源的网页、应用程式、外部链接等。以上四个区域为学生开放区。第五个部分为教师控制板（Control Panel），用于教师开发和管理整个课程，不向学生开放。教师控制板用于开发和管理整个课程，主要工具有：课程内容汇集、课程工具汇集、用户分组管理、 评分中心和查询帮助等。其中评分中心（Grade Center）是教师为作业、测验、考试等提供反馈和打分的直通窗口，并承担课程行进中统计分数的职能。图一为Chinese 1A课程管理主菜单示意图。



图一：Chinese1A课程管理区域主菜单示意图

课程信息版块用于发布与课程相关的信息，如：教师自我介绍、课程大纲、授课计划进程、布告通知、评分标准、网络技术要求、注意事项等。课程信息版块内具体的内容配置如下面图二所示。

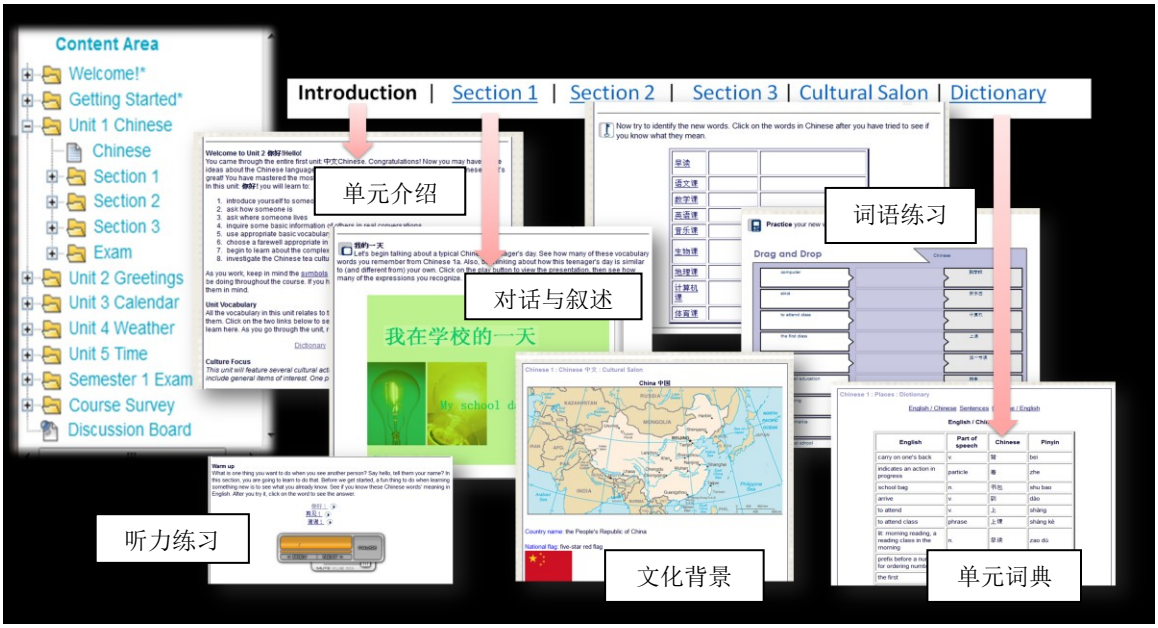
课程内容区承载着教学的主体任务。内容区的布局设计是网络课程的核心，它不仅需要符合平台本身的结构要求，同时也需要体现特定的教学法理念。根据Blackboard本身的“层级性”结构特点（Level），考虑到网络课程的自学性及其对便捷和易于梳理的需要，我们确定了不超过三级的课程内容层级结构。第一层级为课程主菜单，以学习单元（Unit）为主，以链接形式作为课程的切入点直接引导学习者进入具体的单元内容和学习工具。第二层级为单元内部的具体学习项目，每个项目可由学习模块、文件夹、学习工具等构成。学习模块或文件夹中可包括学习内容的讲座式传授、讲练结合网页、学生应对操练任务、互动活动、学习成果测试及反馈评估等。第二层级的学习项目允许多个模块或文件夹平行并列出现。第三层级为二级学习模块下的次级模块，也是本课程中的终极单元。这一层级的模块主要带领学生进入具体的学习任务操练，用于提交作业或报告、开展互动活动、进行小组讨论和测验考试等。尽管Blackboard层级结构支持三个等级以上的更加复杂的多层级设计，但课程的实际运行经验说明将课程的层级控制在三级以内有助于学生浏览学习内容、完成各项任务，避免遗漏和由过多层级造成的困惑。图三为课程的层级结构示意图。



图二：课程信息版块内具体的内容配置

图三：Chinese1A课程内容版块层级示意图

按照课程蓝本自身的结构，每一单元内部一般再分为：单元介绍、学习板块一（第一部分）、学习板块二（第二部分）、学习板块三（第三部分）、文化背景知识、单元词典等。学习板块是各个单元的主体，集合 Blackboard 所提供的各种输入性学习程式、互动型交流工具和产出性操练平台，是承担传授课程内容和学习者学习操练，完成各项任务的核心平台。图四为单元内部结构以及学习模块中各种学习板块的截图。



图四：Chinese 1A课程内容版块中单元结构示意图

课程单元内部的三大学习板块以及小测验、作业、专题任务、单元考试、文化要点、单元词典等任务主要是在Blackboard内容区所提供的学习模块、文件夹、项目、HTML网页上进行组织和呈现的。

作为一个综合性的学习内容组织工具，学习模块以其多样性的承载功能，将各种形式的学习内容如 Flash 幻灯片演示、生词与语法的多媒体讲解、词语语义关系讲解与练习、文化知识传授、参考词典、作业和测试等整合在一起，并能以下一级的目录菜单组织整合，方便学习者按照设计顺序学习。文件夹功能赋予教师对各种学习任务和资源进行重新组合的权限，使教师能够根据不同教学目标，筛选课程已有资源或生成新的学习材料，通过定制学习任务满足特定教学的要求。两种不同侧重的网页工具：综合性动态网页（Item）（允许在页面内独立展示多种多媒体资源）和链接式静态网页（Blank Page）（提供引导到第三方网站的链接），为增加学习参考资源，补充学习任务，展示教师的说明和讲解等提供了方便。此外 Blackboard 上的讨论板（Discussion Board）、博客、作业（Assignment）支持多种文档的提交。其测试（Testing）平台支持多种测试形式，如多项选择、问题回答、听力与书写测验、作文写作、单元测验、学期综合考试等。所有作业任务和测试均与“成绩中心”内多种评改工具动态相连，方便教师和学生对学习进度即时监控。下面表六以 Chinese1A 中第二单元为例说明单元内部结构、层级和本单元所采用的 Blackboard 支持的工具类别及其用途。

表六：Chinese1A 单元内部结构、层级及工具类别

单元内部结构	层级	工具类别
第二单元 问候	1	课程主菜单
单元简介：欢迎、生词列表、单元活动简介	2	项目(Item)
第一部分： 问候	2	学习模块(Learning Module)

学习模块：情景简介、热身练习、对话播发、语法注释、句型学习、词语训练、中国人的姓名	3	项目(Item)
活动:小组讨论	3	讨论(Discussion)
第二部分：自我介绍	2	学习模块(Learning Module)
学习模块：问候、回答、对话播放、在线练习	3	项目(Item)
作业 1：提交自我介绍录音	3	讨论(Assignment)
作业 2：书写问候与再见用语	3	作业(Assignment)
小组讨论：互致问候	3	讨论(Discussion)
小测验：多项选择	3	测试(Test)
第三部分：语法重点	2	学习模块(Learning Module)
学习模块：人称代词系统与用法（幻灯讲座）、在线练习	3	项目(Item)
作业：录音提交（自拟对话）	3	作业(Assignment)
测验：多项选择和简要回答问题	3	作业(Assignment)
单元测验	2	文件夹(Folder)
听力部分	3	测试 (Test)
书写部分	3	测试 (Test)
文化要点	2	项目(Item)
中国茶文化	3	项目(Item)
单元词典	2	项目(Item)
英汉列表	3	项目(Item)
汉英列表	3	项目(Item)

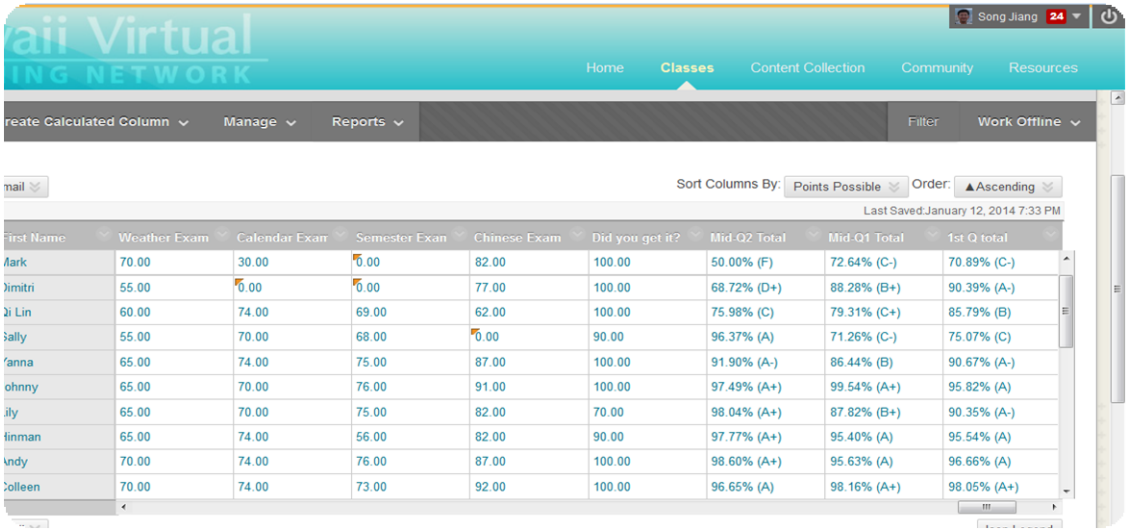
6. 课程管理与学生成绩评定

本课程为一学年课程，供两个学期使用。Chinese 1A在秋季学期开设，Chinese 1B在转年的春季学期开设。为配合夏威夷州教育部的学期计划，每门课程每学期各安排18个星期的教学内容。每门课每学期的学习任务由近100个旨在培养听说读写各项汉语技能的作业、任务（project）、在线讨论、互动活动、小测验、单元考试和学期综合考试等构成。学生每提交一项完成的任务，或经Blackboard自动校验打分，或由教师批改评分后均可获得适当的积分。在每门课程中，如学生能以满分完成所有的任务，则可获得每门课程中全部满分1600分。由于夏威夷州K-12学校每个学期又分为两个中期学期，即第一个四分之一学期（Quarter 1）和第二个四分之一学期（Quarter 2），每个学期教师总共需要为每个学生给出三个成绩，即Quarter 1， Quarter 2和学期总成绩。以Chinese1A为例，Quarter 1 总共需完成718个积分，Quarter 2 总共需完成882个积分，全年满分总工作量为1600积分。学生的中期成绩和全年成绩（A-F）由各阶段实际获取积分在全部提供的积分中所占的百分比决定。表七以Chinese1A的学期总成绩为例说明学期成绩的评分标准。

表七：Chinese1A学期成绩评定标准

Period	Total tasks	Total Points	Percentage	Cut Points	Letter Grade
Semester 1	95	1600	90%	1440	A
			80%	1280	B
			70%	1120	C
			60%	960	D
			blow 60%	below 960	F

课程中所有的作业和专项任务，如日常功课、日记、project、小测验、单元考试等，课程中所有的学习互动活动，如讨论、博客、VocieThreads、虚拟课堂活动等均可通过“成绩管理中心”统一管理。教师可通过“成绩管理中心”对课程中所有的学习任务进行评定、打分，并可对各项任务的分值及其在学生总成绩中的比例进行设置或调整。图五为“成绩管理中心”的截图。



图五：成绩管理中心及成绩统计

针对不同的学习任务和教学目标，Chinese 1A和Chinese 1B主要采用了两种评分手段：一种为课程自动评分，另一类为教师批阅式手动评分。电脑自动评分主要适用于巩固语言技能类练习、知识性内容自测和机械性测验和考试（如多项选择）等。对于需要学生运用所学语言知识完成的原创性任务：如小组专题讨论、博客发布、研究型专题报告（如以“香港的美食”和“北京城的历史和现状”为题的专题报告）等，则采用教师批阅式手动评分。为了保证学生完成这一类任务的质量，课程设计中除了在布置功课时注重明确任务的要求外，还为学生提供了评分标准（Rubric）作为学生完成任务过程中的向导和参考。Blackboard在单元任务区的呈现页面和教师评分的评估界面都设有评分标准的链接，为学生和教师提供即时的参考。表八为Chinese1B针对讨论任务所采用的评分标准。

表八：讨论任务的评分标准（Rubric）

Discussion Criteria	Levels of Achievement			
	Failing	**Average**	**Good**	**Exceptional**
Responsiveness to discussion assignment prompt	**0 Points** Does not address discussion questions.	**1 Points** Addresses some of the discussion questions.	**2 Points** Addresses all discussion questions and directions.	**3 Points** Addresses all discussion questions and directions in depth.
Interaction with peers	**0 Points** Does not respond to others.	**1 Points** Gives comments that respond to only a few of the discussion questions	**2 Points** Gives comments that respond to most discussion questions	**3 Points** Gives comments that respond to all assigned topic thoughtfully
Use of vocabulary and sentence patterns in the unit	**0 Points** Makes little or no use of unit vocabulary and patterns.	**1 Points** Shows effort in using some of the unit vocabulary and patterns, but may be forced and with obvious errors affecting understanding.	**2 Points** Make use of the unit vocabulary and patterns, but the use may be unnatural with errors do not affect understanding	**3 Points** Makes excellent and appropriate use of the unit vocabulary and patterns.
Communication of original ideas	**0 Points** Doesn't communicate an idea.	**1 Points** Ideas are communicated, but no supporting examples or details are given.	**2 Points** Ideas are communicated clearly, but only some examples or details are provided to support the ideas and option.	**3 Points** Ideas are communicated eloquently and thoroughly. Specific examples or details are provided to support the ideas and option
Engagement	**0 Points** Posting was done quickly without giving serious thought	**1 Points** Participates in and contributes to dissection, but in a passive way.	**2 Points** Engaged in the discussion and some effort in keeping conversation flowing are demonstrated.	**3 Points** Fully engaged in the discussion with enthusiasm and show clearly effort in keep conversation going.

另外，Blackboard Learn 9.1版本更新的课程管理程式具有向系统内上传各种现成的教学目标或课程标准的功能，方便课程内容与特定的教学目标的对比和接轨。课程设计者和教师可以在上传的固定教学目标中为系统中各个区域的教学内容，包括学习模块、教学计划、授课重点、讨论题目、博客、日记、测验、考试等搜索、确认适用的教学标准，实现具体教学内容与目标大纲的对应匹配。

在本课程的设计中，利用Blackboard的这一功能，我们在每个单元的介绍部分除列出明确的教学目标以外，同时还将每个单元的教学目标与夏威夷州教育部世界语言课程目的标准直接系联起来，根据夏威夷州的课程标准对各单元内容进行必要的剪裁、补充和调整。例如, Chinese 1B的第七单元“家庭”的单元教学目标为：

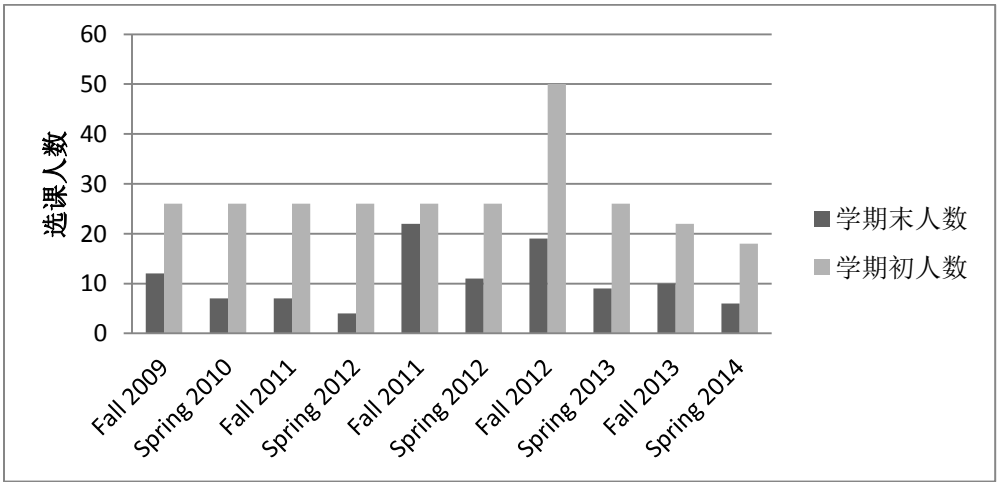
（1）能够谈论自己的家庭成员，（2）能够谈论自己家人的生日、年龄、工作等基本情况；（3）复习日期和数字的表达法；（4）能够收集并理解中国一般家庭重要的文化习俗。针对本单元的具体教学目标，我们从夏威夷州教育部世界语言课程大纲中搜索到以下相应的目标（如表九所示），并以此为标准对课程内容进行必要的补充和调整，以期使本单元的教学任务能够更好地为实现这些教学目标服务。

表九：单元授课目标与夏威夷州世界语言课程标准的截图

Active Goals			
ID	**Goal**	**Goal Set Name**	**Category**
WL.IS.Y1.1.1	Ask and answer social questions to get information or to maintain a conversation	HI: World Languages (2005)	Year 1
WL.IS.Y1.3.1	Use oral language skills to make simple presentations	HI: World Languages (2005)	Year 1
WL.IS.Y1.4.1	Give examples of how significant cultural ideas are reflected in the practices and products of the culture being studied	HI: World Languages (2005)	Year 1

7. 教学实施的反馈与评估

笔者于2009年夏季开始进行Chinese 1A的课程内容与Blackboard管理平台的整合，同年秋季Blackboard版本的Chinese 1A正式通过夏威夷州教育部所属的E-school向全州开放。课程面向全夏威夷州的公立高中，学生来自瓦胡岛和周边的大岛及茂宜岛等。第二学期的Chinese 1B的内容修订和平台移植在秋季与Chinese 1A的开设同时进行，并在年内完成，于2010年1月Chinese 1A结束后如期接续开课。从2009年秋季至2014年春季的五年间，Chinese 1A在秋季学期，Chinese 1B在夏季学期各开设了5次，两门课程交替开设总共10个学期。五年间成功完成每门课程的总人次达107人次。2009秋季至2014春季每学期学期初与学期末各个课程的实际选课人数对比由下图六表示。



图六：2009 Fall-2014 Spring 学生选课人数情况

通过上图每个学期学期初和学期末选课人数的比较，可以看出尽管五年来，有107人次有始至终地成功完成了这一系列课程，但不容忽视的是每个学期都有相当数量的学生中途退课，未能成功完成整个学期的学习。从图中统计不难看出，五年中能够完成课程的人数大致只有学期初全部选课人数的三分之一，中途退课人数比例高达最初选课人数的三分之二。可见如何保证高比例的选课人成功完成整个学期的学习任务是网络语言课程所面对的一个挑战。

从2011秋季到2013年秋季共四个学期的学生结课评估结果中可以观察到这一初级网络语言课中存在的一些规律性的现象和问题。结课评估主要是以问卷调查的形式在期末结课前利用Blackboard平台进行的。通过对这一期间参加课程学生的36份有效问卷的分析，可以对学生选课动机、对多媒体在线工具的认知和选用，以及完成网络学习的时间和地点得出一些有规律性的认识。

首先在选课动机上，在允许多选的情况下，因所在学校没有条件开设汉语课而选上这门课的人占据了66%以上。排在第二位的是“个人性的原因”，主要集中在个人主观愿望（wanted to learn Chinese）、华裔学生对了解汉语言文化的渴望（to learn more about my culture and learn the language）和与家庭亲属交流的需要（to help me connect with some of m relatives）。其次的原因分别为“毕业的需要”，“为选上高一级课程”和“解决与本校所开汉语课在时间上的冲突”。

表十：学习动机问卷调查结果

What was the reason for taking this course? (select all that apply)			
	Response Percent	**Response Count**	**Rating Count**
Course was taken for credit recovery	0.0%	0	36
Course was a prerequisite for advanced level courses	16.7%	6	36
Course was required for graduation	19.4%	7	36
Course was not offered at school	**66.7%**	**24**	
Course at school was unavailable due to scheduling conflict	13.9%	5	36
Other (please specify)	50.0%	18	36

尽管Blackboard具有整合各种最新多媒体交际工具的能力，并为这些工具的使用提供了便利的操作平台，但学生在问卷回答中反映出来的对于这些新工具的态度却并没有我们预想的那么积极。问卷列出博客、讨论台、电子邮件、日记、虚拟课堂、VoiceThread和Wiki等Blackboard系统支持的工具，请学生回答“你认为这些工具在多大程度上对你进行有效的网络课程学习有帮助？”学生的回答显示他们对新的、复杂的工具的认同需要有一个认识的过程。例如，对于博客、VocieThread、Wiki和日记等四种Blackboard中虽然提供，但在课程的实际教学中并没有广泛使用的工具，超过50%以上的学生选择无从判断。对于日常使用频率高、学生熟悉、常用且技术上不甚复杂的工具，如电子邮件，学生对其有效性的评估则高于其他所有工具。此外，对于课程中规定使用的工具，如讨论论坛、虚拟课堂等，学生对其有效性的评价，虽然不及电子邮件类的工具高，但明显高于使用频率低的工具，如博客、日记等。由此可见，新工具的普及和应用需要经过课程的倡导和实际使用才能

彰显出其有效性。下面的表十一列出学生对Blackboard中提供的各种在线工具的有效性的认知程度。

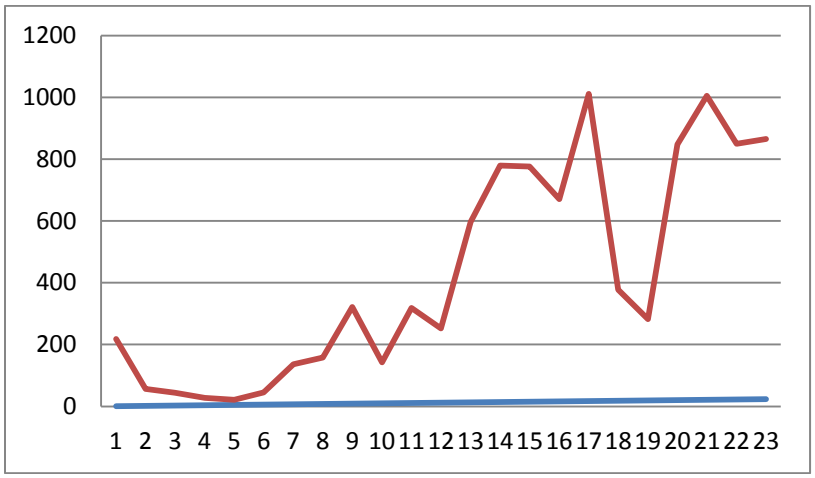
表十一：学生对各种在线工具的认识

To what extent did you feel these tools helped to engage you in the course?

	Considerably (4)	(3)	(2)	Not at all (1)	N/A	Rating Count
1. Blog	13.9% (5)	0.0% (0)	13.9% (5)	0.0% (0)	**72.2% (26)**	**36**
2. Discussion board	22.2% (8)	**52.8% (19)**	25% (9)	0.0% (0)	0.0% (0)	36
3. Email	**55.6% (20)**	19.4% (7)	13.9.% (5)	0.0% (0)	16.7% (4)	36
4. Journal	11.1% (4)	0.0% (0)	13.9% (5)	0.0% (0)	**75% (27)**	**36**
5. Virtual classroom	19.4% (7)	0.0% (0)	27.8% (10)	22.2% (8)	**30.6% (11)**	**36**
6. VoiceThread	5.6% (2)	19.4% (7)	16.7% (6)	0.0% (0)	**58.3% (21)**	**36**
7. Wiki	33.3% (12)	0.0% (0)	16.7% (6)	0.0% (0)	**50.0% (18)**	**36**

关于学生进行网络学习的地点，问卷结果显示85%学生主要是在家中进行网络课程学习的，剩余15%的学生则选择在学校的电脑室完成网络学习。关于学习的时间，在允许选择多个选项的条件下，83%的学生主要利用每周晚上的时间完成绝大部分的学习任务。超过50%的学生主要利用在周末的晚上完成绝大部分的工作。大约30%的学生是在下午放学后进行学习的，而16%是在白天正式上课的时间段学习的。

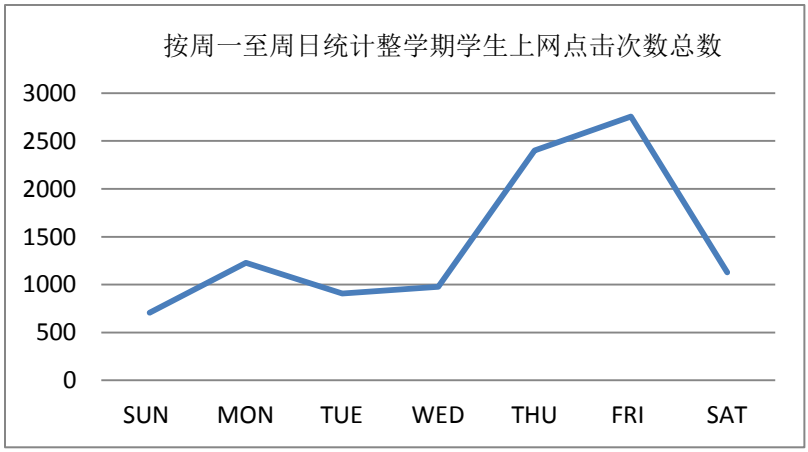
利用Blackboard的统计工具，我们可以以一天为单位，综合所有学习者整个学期的点击率，从中观察学习者平均一天中那个时段的学习活动最为集中。图七的曲线以Chinese1B Spring 2014学期为例，显示选课学生一天之内有两个在线活动高峰：一个是在下午四点到五点钟左右，另一个在晚间九点到十一点这个时间段。



图七：Chinese1B Spring 2014以一天之中各个小时为单位统计整学期学生在线活动点击次数总计

图八以周日到周六为单位，利用学生在Chinese1B spring 2014学期的点击资料显示一周七天的综合点击率。从图中可以看出，学生在线活动主要集中在周四到周六，伴随着周一的一个小高潮。这一分布与课程的学期时间安排计划相吻合。星期六为

每周提交功课的截至期，因此造成大部分的活动集中在截至期的前两天，而周一为新一轮功课和学习任务的开始，吸引学生集中查验本周的任务。



图八：Chinese1B Spring 2014学期周一至周日整学期学生上网点击次数总计

8. 初级汉语教学实践的启示

Chinese1A和Chinese1B过去五年的运行，在课程内容的重构、实际教学和总结反思等方面积累了一定的经验。在这些经验当中，既有值得分享的成功优势，也有亟待反思的问题和挑战。

这两门初级汉语网络课程的教学实践在很多方面为我们展现了网络语言课程的优势。首先，网络课程可以容纳比传统课本和传统课堂更加丰富、更为多样的学习材料和教学资源，同时为语言知识的传递和语言技能的训练提供了崭新方式。其次，不断更新的网络课程平台通过整合新技术以多媒体形式为学习者提供了大量全方位的语言与文化知识的输入，从而使网络课程在目的语输入上成为一个优于任何传统教学媒介的平台。目的语的全方位输入是语言课程追求的理想目标，也是最大限度扩大语言教学效果的关键。网络课程为实践理想的语言教学手段奠定了良好的基础。网络语言课程的优势还体现在网络课程管理系统能够提供可无限重复的语言示范与多种形式的机械性语言训练。这一点正是初级语言课程特别需要的。网络课程具有集中多种网络社交工具的独特功能，这为教师与学生、学生与学生的互动和协作学习提供了多种可能。此外，网络课程在时间和地点上为学习者和授课教师提供了极大的便利，也使不具备教学资源和开课条件的学校能够分享网络课程教师和课程资源。

这两门课程多年来的教学实践也使我们对初级网络汉语课程设计和实施过程中存在的问题和挑战有了较为清楚的认识。首先，作为给州公立初中或高中学校学生开设的汉语入门课程，它的设计和运行必须充分考虑到初、高中学生的特点和入门课程本身的目的要求。在传递课程知识的同时，课程设计者和授课教师必须清楚地了解学生的选课动机和目标，在课程管理方面注重点燃和培植学生的学习动力，使之保持应有的持续性。其次，为确保课程中各项学习活动的行进质量和教学效果，

一定要增加对学生学习过程和效果的监控，教师不仅应该自己密切关注学生的学习动态，还应尽可能获取学生所属学校的课籍管理、学生顾问、甚至家长的支持与协助。特别是在学生需要独立应对网络课程中大量机械性自学模块、自我监测的作业和任务时，来自多方位的敦促和支持将对学生成功完成课程所规定的任务起到十分关键的作用。

此外，积极踊跃的注册人数和学期末近三分之二的高退课率是这几年这一系列课程运行中存在的最显著的问题。这门课程的高注册率很可能源于E-school环境下开设网络入门汉语课程本身所具有的吸引力，如时间上的便捷和自由、不设门槛的选课要求、零起点入门课程的诱惑等等。但与高注册率相背离的高退课率，则需要我们思考学生退课的原因，出台应对措施。固然，学生选课时对外语学习的工作量和个人投入的估计不足很可能是造成退课的主要原因，但网络入门外语课程本身可能有的一些特性，如枯燥的在线基本技能操练、大量的自学模块、自主的作业和任务、电脑自动核查批改、师生面对面互动的缺乏等，也都可能在开课后消弱学生坚持网上学习的积极性，造成无法按进度完成所有的任务，丧失继续学习的信心，最终导致我们所看到的高退课率。针对这些造成高退课率的可能原因，教师应当积极思考应对措施，通过安排和组织有针对性的线上或线下课程活动，保持学生的学习积极性，协助学生按计划完成学习任务，树立成功完成整个课程的信心。

另外，网络课程教学对教师也提出了特别的挑战。对于外语学习来说，语言教师对学生学习表现的反馈是保证学生语言习得效果的重要一环。而在网络课程环境下，教师对学生完成的各项任务和作业的及时反馈则更具有特殊的意义。由于缺乏面对面直接交流，如何及时对学生的语言产出提供更正和评价，特别是对于学生发音、口语和对话等方面提供建设性的反馈，是对网络语言教师的一个特别的考验 。

课程结业问卷调查中，学生对各种网络工具的有效性所表达出来的看法为如何提升各种工具在网络课程中的使用提出了建设性的意见。显然，教师不能简单地寄希望于学生自动地启用新技术或新工具。加强对课程内社交互动工具使用的示范与引导，提升学生使用技术的兴趣和熟练度，应当成为网路语言教师职责的一部分。

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應用無縫與翻轉學習模式在中文教學的融合與統整應用
(Blend your lessons through flipped and seamless learning)

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摘要：一對一的數位學習、無縫學習、互動融合教學等模式與應用，近年來在華語文教學裡扮演極重要的輔助學習的角色。如何透過個人行動工具，隨時、隨地，在課室、在家裡，跨時、異地地透過無線網路、無縫的教學平台與翻轉模式(Flipped models)教學設計，使學習者能更有趣且更有效地參與各項語言學習活動，是本文所關注的課題。本文以筆者在美國高中正式外語學習課程教學設計為例，說明如何利用 learning hubs 的概念，應用如 1know, blendspace 等平台，及 Flipped models 進行外語教學設計及統整，建立學習的 playlist，並分析學習者的學習成效與數位學習使用心得。

Abstract: Blended learning, one to one mobile learning, seamless learning, and interactive applications are on the rise and are playing important roles in assisting Chinese language learning in the 21st century. This paper will focus on the importance of switching between devices and contexts for a fluid learning experience via learning hubs, the interactive teaching platforms such as 1know and blendspace. In this paper, the author analyzes the Flipped classroom teaching model and interactive style through learning hub platform applications. She also shows how to use learning hubs to blend lessons and stimulate students to access, engage, and practice their learning eagerly. Additionally, she provides options and suggestions for teachers to design a lesson where students are interacting effectively both in and out of the classroom.

關鍵詞：無縫學習、翻轉學習、華語文數位應用

Keywords: Seamless learning, flipped classroom, learning hub

1. 引言及翻轉模式和無縫學習的介紹

2013 年 TED 獎獲得者英國新堡大學 (Newcastle University)教授 Sugata Mitrau 一段撼動教育者的演說「建立一所雲端學校」，明白揭示了科技對未來世代和當代學校體制的衝擊。隨著可汗學院 (Khan Academy) 的線上學習引領風潮，無縫學習

(Seemless learning) 概念以及 Jon Bergmann 與 Aaron Sams(2011) 倡導的翻轉教室（Flipped classroom）教學模式等的推廣，都對科技應用於學習的形式，起了或深或淺的影響。

「翻轉教室」（Flipped classroom）又稱/「翻轉學習」，其基本概念是將傳統的教學順序加以反轉。通常，教師在教室裡教授基本知識與概念，讓學生瞭解基本的知識內容。學生下課回家後進行練習與深化所學。這種傳統教學方式常常面臨的問題是，學生自行研究、獨自進行練習的時候，正是他們容易發生困難的階段當他們想要進行深化應用時，反而無人可問。翻轉教室的基本概念就是針對這種問題而生:即教師以解決學習者學習問題為主要目標，把較少需要討論，學習者容易理解的知識內容在課前傳達。上課期間，透過同儕的互動、討論加強學生對這些概念的理解和應用，也讓老師有機會、有時間利用課堂時間裡針對學生的問題馬上解決，立即回答。因為這種模式將原來傳統在教室裡的教學活動，翻轉成在家裡進行，而將通常在家裡的延伸學習，轉成在教室裡進行，故稱之為「反轉/翻轉教室」。

如果純粹將翻轉教室/翻轉學習視為在家時，讓學習者觀看教學影片，那真是一種對此教學策略或教學方法的一種誤解。筆者認為，尤其在語言課室裡，真正運用翻轉教學的目的，最重要的便是，讓學習者在家裡先將基本的語言要素（如生字、片語、語音等）有了瞭解及事先練習的機會，到了課堂時間，教師便能更充分地運用來引導學生進行更深入的語言練習及產出的學習活動。

關於無縫學習，不同學者對其定義不同（Gruber, Cooper & Coigt, 2013).根據 Chan 等人(2006)的定義，無縫學習可以說是隨時隨地隨學習者的需要進行學習（learning wherever, whenever and whatever）」。本文採用 Looi et al (2010) 的定義，「讓學習者在任何時候都可以進行學習，並透過社群與彼此互動」嘗試將無縫學習的概念，應用在教學現場及課後學習，使學習者在實體課堂中的學習、互動、合作，以及課後的複習、預習及筆記練習都能透過一個有效的學習平台整合，使學習的情境與內容在轉換上更平順。

2. 本個案背景說明

自 2007 年起，筆者所任教的學校，便利用一對一的數位工具進行高中所有學科的教與學應用。自 2011 年起，校內全面不採購紙本教材，希冀教師能自行利用網路 e-resources 以及自編教材、教材設計及各項工具等來進行教學。2013-2014 學年度，修習中文為外語課程者，中文一學生共 30 人，均無華裔背景。中文二共 27 人，均無華裔背景。中文三，20 人，4 人具華裔背景。中文四，8 人，四人具華裔背景。筆者 (2009) 曾針對學習者如何利用 web 2.0 工具進行教學設計及科技應用分享，強調科技優勢能為教學帶來活水，教師能帶領學生，運用最適當的媒體工具，來幫助學生學習；但在整個教與學設的過程中，應避免將 Blog、Moodle 等 Web 2.0 工具僅作為教學公佈欄、作業收集區，從而全然失去其成為 Web 2.0 工具所具備的可促進互動、參與的真正意涵。此外，筆者亦在 2011 及 2012 年 ACTFL 全美外語大會，針對 flipped classroom 在華語文的教學設計進行教學做過分享。

在翻轉的應用上，筆者在 2012 年一月起，開始在任教的班級開始實施。從錄製最簡單的生字片語開始，進而錄製句型、閱讀理解、寫作規範等實行至今。其做法是： 首先，學習者在家觀看影片，利用教師事先準備的學習單進行影片重點摘要，筆記書寫或利用 Google form + MCQ 進行影片內容、閱讀理解的基本檢測；第二天到教室裡進行進階語言教學活動練習，討論及各項聽說讀寫活動應用。當學習者熟悉這一系列 flipped classroom 流程後，筆者再利用 video note 讓學習者有機會利用打字進行影片摘要。自 2012 初-2014 年夏兩年半的研究裡發現，學習者透過「有效的筆記、摘要」的流程，不僅學習了中文，也學習並強化了「怎麼學習」的策略。

3. 所用平台需求的選擇與主要功能說明

筆者曾利用過 Moolde 教室建置、Google site 應用、weebly 網頁、Edmodo 教室作為翻轉學習（自 2010 年起開始正式應用於教學中）以及無縫學習的平台，但終究有「上課是一套，課前課後又是另一套」的不銜接處之憾。以上各種平台，以及其相關各式教學平台，筆者認為都非常適合作為學習者課前及課後的預習、複習及提交功課的平台，惜無法將同步時所需要的「互動、參與、紀錄」一併納入其中，必須透過其他的網路工具來協助。例如 Google form + MCQ 執行測驗；利用 Edmodo + educration 進行 flipped video 的影片錄製與存放；利用 Edmodo＋Video.note 來進行影片的筆記等等。免不了需要管理帳號，記住各種平台的密碼。在如何善用單一平台，集結、整理、製作成方便好用的教學資源的過程中，師生均有其困難之處。

2012 年起，因著 ipad 的方便使用，許多教學 apps 也進入教學現場協助學習者學習、分享、互動變得更容易。例如 Nearpod app 的應用，的確啟發了筆者對於無縫學習的另一種期待。兩年半的翻轉與無縫的教學行動研究的歷程中，筆者發現：翻轉教學影片加上學習者的摘要，對於學習者在家裡進行學習，有極大的幫助。而在教室課堂裡的互動活動，若能記錄下來，也同時能幫助學習者回溯學習歷程，強化學習中需要改進或足資作為學習歷程紀錄的一部份。

是以筆者秉持行動研究的核心：發現教學現場的問題後，嘗試能找到一個學習平台，可以將學習影片嵌入、學習者可以在線上一邊觀看影片，一邊做筆記，而筆記可以分享給同學，老師也可以進行學習追蹤，更可以幫助學習者隨時回溯學習者學習紀錄等來輔助及強化翻轉學習模式需求；在無縫學習上，希望能找到一個平台，能讓學習者在課內同步應用有基本的應用工具，教師不必將各式各樣 2.0 的工具串連在一起；可以記錄下學習者在教室裡怎麼應用這些工具的，也能提供課前課後在家裡進行複習、預習的功能，因著平台的功能，提供無縫學習的基本應用。在進行多項工具嘗試與試用後，最後選定 1know 教學平台 (1know.net)（圖一）。

除了上述筆者的主需求外，1know 教學平台視每一個主題，不論大小，都是一門「知識 knowledge」（圖二）。學習者和教師，每個人在這個平台裡，都可以是知識的提供者創建者，也可以是知識的學習者。 每一個人都可以申請免費帳號，

免費帳號的限制是所有創見的知識都必須和別人公開分享，也無法進行線上同步教室即時應用。它除了具有上述筆者迫切需要的影片筆記功能外，還具備教學資源網頁編寫、學習者同步線上參與（google handout 結合）、線上即時分享含投票、塗鴉（在漢語教學上，可以應用寫字、聽說練習等等）。針對不公開的知識，學習者在取得訂閱的知識代碼後，便可以加入該門知識（圖三）。

教師申請一個 plus 的帳號（目前免費）後，可以建置自己的線上教室，在教室裡，學習者一樣僅需要群體教室代碼後便能加入。登入線上教室後，所有的教學主題（知識）及教學活動可以被教師隨時加入，或隨時進行（圖四）。

以筆者教學為例，在每一主題裡利用 flipped 影片進行基本語言內容教學，學習者必須在家先觀看影片，並同步進行做筆記的動作（圖五），此後學習者可隨時回頭查找、修改此份筆記（圖六）。教師可以在上課前，清楚地知悉學習者是否已完成影片觀看及做筆記的動作（圖七），學習者也可以看到自己的學習記錄（圖八）。

圖 1： 1know 平台的首頁

圖 2： 1know 的知識頁面

圖 3：單一主題課前課後的學習介面

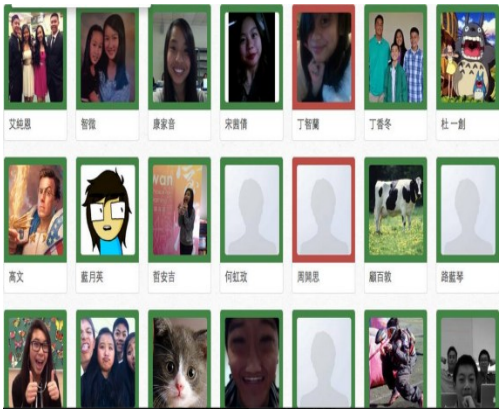

圖 4：線上同步進行活動時的登入介面

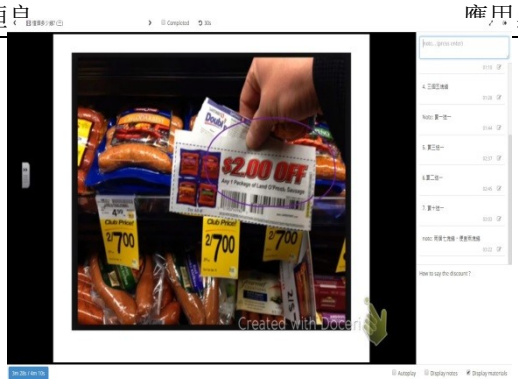

圖 5：學習者進行 flipped video 所看到的介面

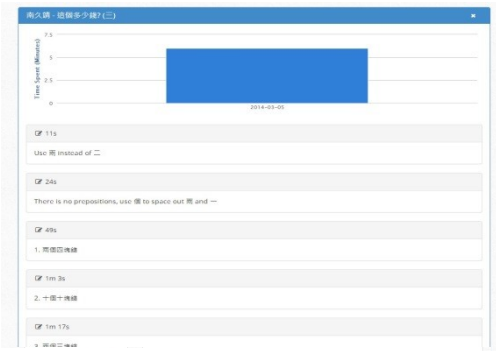

圖 6：Flipped video 個人筆記完成的介面

圖 7：全班觀看影片及筆記的學習紀錄

圖 8：學習者個人化學習資訊及記錄

在教學研究上，教師還可以透過單一影片的分析（圖九）以在上課前，就可以知道學習者摘要或問題集中點，個人分別有哪些問題，都可以利用平台裡的分析功能掌握學習動態（圖十）。也提供了課堂互動活動中塗鴉版及問卷等功能的紀錄（圖十一及十二）。

圖 9：單一影片全班的紀錄頁面

圖 10：單一影片全班的筆記記錄

圖 11：學習者利用課堂塗鴉版練習生字的活動

圖 12：課堂中學習問卷、互動等測驗統計記錄（可重複播放）

4. 其他相關平台

除了上述筆者所使用的 1Know 平台外，，近年來，學術界及業界也無獨有偶地推出了不少可以進行翻轉學習及無縫學習的平台，如 blendspace，knowia，Sophia，TED-ed，eduCanono，VideoNot.es 等。這些易學、實用的平台（見圖 13 至 18 的圖示），為初次應用翻轉學習模式的教師，提供了最基本的學習與檢測機制。學習者可以利用這些平台在閱讀影片後進行理解測驗活動、學習活動並同時對這些活動進行記錄，下面表一對這些平台的功能作簡要總結、對比。

圖 13：blendspace 的 playlist 教學應用

圖 14：knowmia 的影音教學活動應用

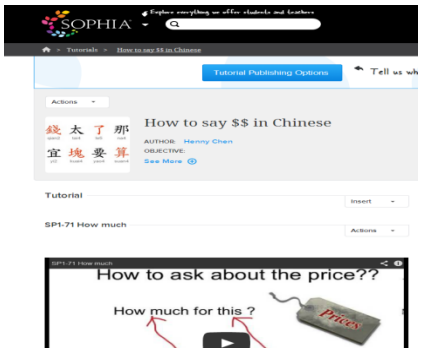

圖 15：Sophia 的 flipped 應用

圖 16：TED-ed 的教學應用

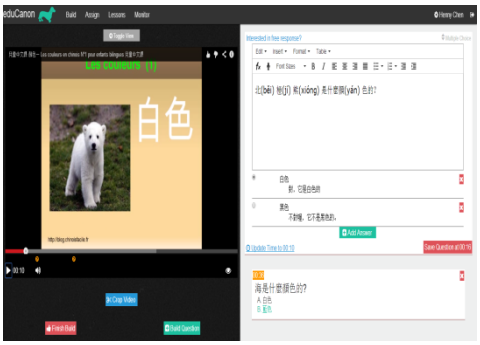

圖 17：EduCanon 的 flipped 應用

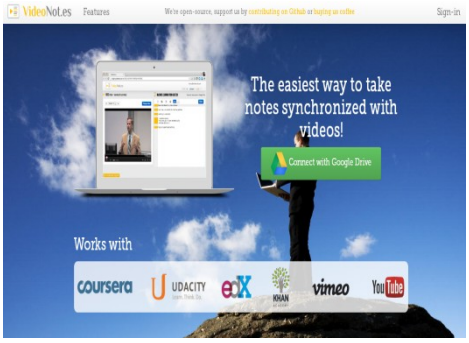

圖 18：VideoNot.es 的首頁

表一 平台簡要功能比較表

平台	提供免費	付費升級	多媒體	測驗回饋與學習記錄	其他特色
blendspace	有	有	文件影音	V	製作學習 playlist、可進行合作
Knowmia	有	無	影音	V	測驗形式多、有 mobile 版
Sophia	有	無	文件影音	V	可進行多種文件媒體嵌入
Ted-ed	有	無	文件影音	V	可進行 High order thinking 學習活動
eduCanon	有	無	圖文影音	V	利用觀看影片進行理解檢測並提供回饋
VideoNot.es	有	無	影音	V	針對影片進行摘要筆記線上記錄，可分享（google drive）

5. 學習者反饋整理

在上述的各平台中，筆者尚未進行每個單一平台全面性實證研究，是以對於單一學習平台的整體適用性，尚無科學驗證。也無具體資料與數據來說明教學應用及學習成果之間的關係。僅能根據學習者的使用至今的回饋與反應，提供以下的使用心得與建言。針對無縫與 flipped 學習的整合上來說，五十七位學習者在兩次的問卷中表示：

1. 與其他平台相較，單一登入系統與連續學習情境（含平台的使用），無紙的綠化及對學習的無縫、無困難經驗都感覺到滿意（98.5%）。
2. 影片的筆記功能（97.5%），同步登入後進行互動學習（95.2%）及非同步的社群交流（90.25%），分別為學習者認為此平台最獨特，且對學習最有幫助的地方。
3. 對於教師的教學設計與應用則認為：play list 式的影片集中與分類（98.5%）、互動遊戲的嵌入（95.25%）及學習歷程的整體設計一貫呈現（92.5% ）為主要的學習利器。

4. 對於平台的建議，則側重於作業上傳及提交的功能需求上（98.5%）。

6. 建議與結語

當科技應用在資源、環境急速變化之際，教學的應用也從「為什麼要用」，「用什麼」，到「怎麼用」，進而更深層地探究到「怎麼用會更好用」的不同階段。科技工具應用於教學上的使用情境，已然也隨著工具及應用情境的成熟，工具已逐漸發展成單一登入，盡可能地將教與學的歷程完整化地成為一個 learning hub 的學習平台。這樣的進展，逐漸發展成一個整合課前、課中及課後無縫學習，並建構著學習者的學習新經驗。

由於本文為對所有平台，進行全面性實證研究，是以對於單一學習平台的整體適用性，尚無科學驗證。期待未來能有更精確的教學實驗與結論提供，以達成學習有效性與否，及相關具體研究的完整佐證。

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