

## LEARNING CHINESE IDIOMS THROUGH IPADS<sup>1</sup>

Chunsheng Yang, University of Connecticut

Ying Xie, Idaho State University

This paper reports on an action research study using iPads during the teaching of Chinese idioms to heritage learners. A class of 12 second-year Chinese learners were engaged in a self-generated learning process focused on learning abstract and concrete idioms using iPads. Students' short-term and long-term learning was measured; feedback from a questionnaire and artifacts created during the learning process are also reported here. The results show that the textual and visual illustrations of the idioms created by the heritage learners facilitated their learning of the idioms. The results also show that the learners enjoyed this mobile way of learning. This study identified three key areas that will need to be addressed in the next cycle of action research: learner collaboration, peer learning and assessment, and technological issues.

**Keywords:** Action Research, Chinese Idioms, iPads, Mobile Learning, Self-Generated Learning, Heritage Learners

**APA Citation:** Yang, C., & Xie, Y. (2013). Learning Chinese idioms through iPads. *Language Learning & Technology*, 17(2), 12–23. Retrieved from <http://llt.msu.edu/issues/june2013/yangxie.pdf>

**Received:** October 9, 2012; **Accepted:** December 27, 2012; **Published:** June 1, 2013

**Copyright:** © Chunsheng Yang and Ying Xie

The field of mobile-assisted language learning (MALL) has witnessed a recent increase of research (Chinnery, 2006; Wong, Chin, Tan, & Liu, 2010). In MALL, mobile devices such as smart phones, personal digital assistants (PDAs), and other technologies are employed in language teaching and learning in both formal and informal contexts (Sharples, 2006; Fallakhair, Pemberton, & Griffiths, 2007). Mobile learning is usually characterized by the availability of extensive learning materials (Geddes, 2004) and the mobility of learning devices (Traxler, 2005; Kukulska-Hulme, 2005; Kukulska-Hulme & Shield, 2006). In MALL, formal learning interacts with informal social interaction, which turns language learning into a real, meaningful, cognitive activity (Mishan, 2005; Wong et al., 2010). Although MALL faces some potential challenges, such as reduced screen sizes, limited audiovisual quality, virtual keyboarding, one-finger data-entry, and limited power as pointed out by Chinnery (2006), MALL appeals to the new generation of language learners who have grown up with the technology.

Apple's iPods, iPhones, and iPads are examples of innovative mobile devices for both communication and learning. Since their launch in April 2010, iPads have drawn great attention from the field of mobile learning. Many high schools, universities, and colleges have started experimenting with the use of iPads in learning different subjects, languages included.

To test the effect of iPads in learning Chinese idioms, the researchers conducted an action research study to examine the immediate and long-term effects of the use of iPads in learning Chinese idioms by Chinese heritage learners in a private mid-western university in the United States.

### BACKGROUND LITERATURE

#### Theoretical Framework

Generative learning (Wittrock, 1989) argues that learners must actively construct meaning in order to achieve understanding. Four components of understanding are proposed for generative learning: generation, motivation, attention, and memory (Wittrock, 1989). Studies have shown that to enable

generative learning to work more effectively, instructors should provide activities to prompt learners to engage in elaborative processes (Wittrock, 1989) and help learners link the material to prior experiences (Wittrock, 1992; Zhong & Majchrzak, 2004). This paper reports a case of generative learning, in which iPads were used to facilitate the heritage learners' learning of Chinese idioms.

This study adopted the action research approach. Action research is an interactive inquiry process. In the spiral model of action research by Coghland and Brannick (2010), action research consists of a series of spiral cycles. Each cycle consists of four stages: constructing, planning action, taking action, and evaluating action. Of these cycles, the findings in one cycle feed back to its own research questions and provide problem areas and direction for the following cycle. This paper reports and reflects on findings in the first cycle of this framework.

### **Previous Studies on Learning Chinese Idioms**

Chinese idioms, due to their conciseness in forms and expressiveness in meaning, play an important role in Chinese learning, for both first language (L1) and second language (L2) learners. It has been shown that the absence of idioms is a pronounced characteristic in L1 Chinese compositions (Tin, 1989). It is observed that such absence is even more noticeable in L2 compositions.

This study focuses on the learning of Chinese idioms by heritage learners. Chinese heritage learners refer to those who were born and raised in Chinese-speaking environments in the United States. Typically, English is these learners' main language of schooling and socialization outside of home. Heritage learners may have very good listening and speaking skills, yet their speech may be constrained in both vocabulary and grammatical structures. One such typical feature of their speech constraint is the lack of proper use of Chinese idioms (Duff & Li, 2004).

Previous research has described some of the reasons why Chinese heritage learners have difficulty learning idioms as compared to other language forms. For example, Lei (2006) found that most Chinese idioms are metaphorical expressions. To learn and properly use these idioms, students not only need to learn these items as functional units, but they also need to understand the culture-specific information conveyed by the idioms. However, having grown up in an English-speaking country, Chinese heritage learners have not typically had sufficient contact with the environment to internalize the socio-cultural information of many or most Chinese idioms. As a response to this problem, the present action research project engaged learners in a collaborative, self-generated learning process, which asked the informants to decipher the indexical relationship between the linguistic form of an idiom and its socio-cultural meaning. Because of the collaborative nature of this activity, iPads were used to facilitate free and mobile cooperation among students.

Previous studies have examined the teaching and learning of Chinese idioms in CALL and MALL. Luk and Ng (1998) reported the utilization of an experimental program for teaching Chinese idioms to students ages 9–11. Their findings showed that CALL contributes to the learning of Chinese idioms. The subjects in their study ranked graphic/drawing illustration the second most effective strategy, next to explanation. Drawing on Nation's (2001) three-stage model of successful vocabulary learning, namely, noticing (i.e., a word is highlighted as being salient text input), retrieving (i.e., repeated encounter of the word), and creating/generating (i.e., use of the word in different contexts), Wong et al. (2010) reported students' personal and meaning making in a mobile learning environment using smartphones. Wong et al. (2010) found that both the in-class and online sharing and discussions of the contexts enhanced the students' understanding of the proper usages of the idioms. They argued that the students' ongoing, open-ended, personal-to-social meaning-making process and artifacts demonstrated the potential of transforming language learning into an authentic learning experience.

Kuo and Hooper's (2004) study also merits attention as it examines the mnemonics on learning Chinese characters. Mnemonics can be defined as learning strategies, consisting of either visual images or words

that facilitate memorization and recall of information (Bellezza, 1981; Wang & Thomas, 1996; Kuo & Hooper, 2004). Kuo and Hooper examined the effects of visual and verbal coding mnemonics on learning Chinese characters in computer-based instruction. Results show that the group that generated their own images outperformed those groups that engaged in visual coding, verbal coding, and translation exercises. Thus, it was argued that generating one's own relationship between a symbol and its meaning appears to be an effective strategy for remembering Chinese characters. Moreover, more abstract errors were made in the posttest than concrete errors. The present study attempts to extend Kuo and Hooper's findings about self-generated mnemonics on character learning by examining the effect of self-generated mnemonics on students' learning of concrete and abstract idioms in Chinese.

This study goes beyond character learning and examines the learning of concrete and abstract idioms in the mobile context. Concrete concepts, representing physical objects, are usually processed and stored as images and verbal presentations. Concrete idioms are those whose meanings literally associate with the combined meanings of the characters involved. For example, the literal meaning of the four characters in *renliu ruzhi* 人流如织 is "people-flow-like-weaving." It is easy to guess the meaning of this idiom from the meaning of the four characters involved: "a large crowd of people coming and going." In contrast, abstract concepts are primarily stored as verbal presentations, with little nonverbal code. With this type of idioms, the meaning cannot be guessed, at least not directly, from the literal meaning of the characters involved, such as in the idiom *luoluo dafang* 落落大方. The literal meaning of the four characters in *luoluo dafang* is "fall-fall-big-square," whereas the actual meaning is "very graceful." Previous studies have shown that it is usually easier to learn concrete concepts than abstract concepts (Rieber & Kini, 1991; Sadoski, Goetz, & Avila, 1995; Sadoski, Paivio, & Goetz, 1991). This study will examine whether the same applies to the learning of concrete and the abstract idioms in Mandarin Chinese.

This paper reports an action research study employing iPads in teaching Chinese idioms to heritage learners. The limited studies on learning Chinese idioms and the necessity of testing the effect of iPads in learning Chinese idioms warrant the action research approach (Kemmis & McTaggart, 1988; Nunan, 1992; Wallace, 1998). Specifically, the following questions will be addressed:

1. How do Chinese heritage learners go about the self-generated learning of Chinese idioms with the help of iPads?
2. What is the short- and long-term effect of the self-generated learning of Chinese idioms in both immediate test and long-term retention test?
3. Will students perform differently on the abstract and concrete idioms in both immediate test and long-term retention test?

## METHODOLOGY

At the beginning of the 2012 winter quarter, each student in a class of twelve second-year Chinese heritage language learners at a large mid-western private university was provided an iPad. The class was exclusively composed of Chinese heritage learners. In the first seven weeks of the ten-week quarter, the learners used iPads extensively, at least twice a week. They used iPads to do in-class reading with the help of a pop-up dictionary program embedded in the browser of the iPads; students posted questions, commented on each other's blog entries, and searched for specific information related to the content in different lessons, such as "the advantages and disadvantages of internet." Thus, the learners were already very comfortable using iPads when this action research study was conducted. During the 8<sup>th</sup> week, the learners were invited to participate in the one-hour study. As study participants were enrolled in a general education course, the focus was on learning the Chinese language and culture in general, not only Chinese idioms. Thus, only one-hour of class time could be devoted to the self-generated learning of idioms. However, we believed that the one-hour self-generated learning of Chinese idioms could still provide

insight into the use of iPads in learning Chinese idioms and would point to new directions for the next cycle of action research.

These students were put in pairs and each pair was required to learn the meaning of six new idioms through the self-generated learning approach. Different pairs were assigned different idioms (see the [Appendix](#) for a list of the idioms). Among the six idioms, three were abstract and three concrete. Students were instructed to work on the idioms on the Wordpress app on iPads so that collaborative, synchronous web-publishing was enabled for all groups. They were required to accomplish the following tasks:

1. To provide the pronunciation and definition of each character in each idiom;
2. To provide the definition of each idiom;
3. To provide a visual illustration of each idiom;
4. To make up a story or sentences with the idioms;
5. To post comments on other groups' work.

There were multiple purposes to this series of activities: first, the definitions of each character in an idiom and the whole idiom allowed students to see the relationship between the idioms and their constituent characters. In this way, students could understand the difference between concrete and abstract idioms. They could also understand that the composite meaning of an abstract idiom is not a simplistic combination of each character's meaning in the idiom. Then, as part of the self-generated learning process, the visual illustration was to strengthen the understanding of the meaning of idioms and to facilitate the retention of idioms. Next, the use of idioms was to encourage learners to put the newly learned idioms into practical use; and finally, viewing and commenting upon each other's idioms was to encourage peer learning and assessment. Students were required to post their work on the class blog site with the Wordpress app on their iPads. However, they were free to use any other apps (i.e., [Pleco dictionary](#)) or web browser to search for the definition and pictures required to accomplish their tasks.

Students took a test immediately after the in-class learning and a retention test after two weeks to see whether they could remember the idioms that they had worked on. A questionnaire was also distributed to elicit students' feedback on learning Chinese idioms through the use of iPads. All students' artifacts were collected for analysis, including their participation in the Wordpress website, their tests, and the questionnaire. Other data collected in the study included the researchers' in-class observations.

## RESULTS

### Statistical Analysis of Students' Artifacts

Because of the time constraints during the class, not all students had time to review the other groups' work. Therefore, in the immediate test, students were merely required to provide the English equivalents to the idioms that their own group had worked on. Almost all students could recall the meaning of the idioms that they worked on, with four students missing one idiom and one student missing two. A careful examination of the six idioms that students had difficulties with showed that four of them were abstract and two were concrete.

In the retention test, students were given all the idioms and were asked to provide the English equivalents for all the idioms that they knew. After two weeks, most students still retained around 40% of the idioms that they had worked on.

Table 1 presents the descriptive statistics of the correct number of definitions in the immediate test and the retention test. It can be seen that the heritage learners provided more correct definitions in the immediate test than in the retention test. It is also worth mentioning that the standard deviation in the retention test is much bigger than that in the immediate test. The difference in standard deviation indicates

Table 1. *Descriptive Statistics for the Immediate and Retention Tests*

	<i>N</i>	<i>M</i>	<i>SD</i>
Immediate Test	12	5.58	.69
Retention Test	12	3.83	1.47

that there are greater individual differences in the retention test than in the immediate test, which may be attributed to the individual differences in language learning.

Table 2 presents the descriptive statistics of the retention of the concrete and the abstract idioms in the retention test. It can be seen that overall, the heritage learners performed better on the concrete idioms than on the abstract idioms.

Table 2. *Descriptive Statistics for the Retention of Concrete and Abstract Idioms*

	<i>N</i>	<i>M</i>	<i>SD</i>
Concrete Idioms	12	2.33	.78
Abstract Idioms	12	1.50	.90

Several *t*-tests were conducted to determine whether the differences in Table 1 and Table 2 were statistically significant. The result of the paired *t*-test on the immediate test and the retention test showed that the heritage learners gave statistically more correct definitions to idioms in the immediate test than in the retention test ( $t(11) = 4.26, p < .01$ ). The result of the paired *t*-test on the correct definitions of concrete and abstract idioms in the immediate test showed that students' performance on the concrete and abstract idioms was not significantly different, probably due to the ceiling effect in that the learners performed very well on both the concrete and the abstract idioms. However, the result of the paired *t*-test on the correct definitions of concrete and abstract idioms in the retention test showed that the difference in the retention test was significant ( $t(11) = 3.46, p < .01$ ), suggesting that concrete idioms were stored longer than abstract idioms.

### Qualitative Analysis of Students' Artifacts

Two students' idiom products (one abstract and one concrete) are displayed in [Figure 1](#).

**Self-Generated Learning.** All groups completed their tasks during class time. However, different groups collaborated differently. In some groups, students worked separately, while in others, the pair collaborated more actively. For the latter groups, they first looked up each character in the idiom on the Pleco app on their iPads. Then, they tried to piece together the meaning of the whole idiom, which was also accompanied by googling the idiom on the Safari browser. Some of the latter groups directly googled the idioms and found websites of Chinese idioms, and then copied and pasted the idioms to the class blog site on the Wordpress app. The different ways of collaboration illustrate the limitations of iPads to some extent. In spite of its versatility and advantages, iPads don't allow different people to work on the same project online simultaneously (different from google docs, on which different people can edit a single document online simultaneously). With respect to the visual illustration, groups varied in their way of finding the most appropriate pictures for their idioms. Some groups used google images and searched for a specific idiom, then chose the picture they deemed appropriate. This was the easiest way. Others first went through the learning of the idioms and then searched for a picture according to the meaning of the idioms. The latter involved more cognitive processing, which may be more beneficial to the retention of idioms. However, further study is required to test this hypothesis.

Concrete idiom

人头攒动 réntóu cuándòng

有很多人，像人山人海

海边人头攒动。

“The beach is full of people.”



Abstract idiom

不屈不挠 bùqū bùnáo

不屈: will not crouch

不挠: will not submit

他很有力，有什么问题都不屈不挠。

“He was very strong and never submitted to any difficulty.”



Figure 1. Two examples of student artifacts: concrete (left) and abstract (right).

It was interesting to make a comparison between learners who worked collaboratively and those who worked separately. As will be discussed in the next section, only two out of the six groups composed stories incorporating all the idioms that they had worked on. These two groups happened to be those who tended to collaborate more in completing their tasks. Meanwhile, the four learners in these two groups were usually the active ones in class and were very highly motivated as well. In comparison, most of the learners who worked separately were generally not as active in class nor did they seem as motivated as those who collaborated with each other in their self-generated learning of idioms. Due to the small sample size of the learners, no statistical analyses could be made about the performance of these two groups of learners in the immediate and retention tests. However, it was speculated that the interaction between the group members in the self-generated learning process may have facilitated the retention of the idioms.

**In-depth Analysis of Learning Outcome.** As for sentence/story make-up, four out of the six groups made up a sentence using each idiom. The other two groups attempted to incorporate all of the idioms into a story. Two stories are cited below; target idioms are underlined and character typos are placed in squares followed by the correct characters in brackets. In spite of some errors and typos, both stories are very interesting and run smoothly.

(a)有一个人，别人都叫她落落大方。她回[会]跳形形色色地[的]跳。可是她每次跳舞前很忐忑不安。因为她是个很的舞者，每次她表演，点银元[电影院]熙熙攘攘。别的舞者很吃[出][醋]，所以想狂风暴雨她。

“There is a person called ‘Graceful’ by others. She can dance all kinds of dances. But every time [before] she dances, she feels uneasy and nervous. Because she is such a very good dancer, the cinema is always filled with bustling people when she dances there. Other dancers are jealous of her, so they want to ‘storm’ her.”

In (a), two idioms were not used correctly. *Luoluo大方* 落落大方 means “very graceful.” This group named a girl as *luoluo大方*. In some cases, if the speaker/writer intends to be funny, it would be ok to name a person this. Another idiom *kuangfeng bayou* 狂风暴雨 “rainstorm” was used incorrectly.

*Kuangfeng baoyu* is usually a noun phrase. The group used this idiom as a verb in their story. In spite of the errors, it is believed that the story with the idioms embedded in it would assist learners in remembering and recalling the meaning of each individual idiom.

(b)在晴空万里的北京，大部分的人口集中在门庭若市的菜市口。一堆人战战兢兢地等待判刑。坚强不屈的官员举起手，发出信号。大义凛然的史翌旻视死如归。周围的情形变得姹紫嫣红。

“In the sunny and cloudless Beijing, many people gathered at the crowded farmer’s market. A group of criminals, scared, were waiting for their execution. The unyielding officials raised their hands and signaled the execution. The brave Shi Yimin confronted the death unflinchingly, which made everything in the neighborhood become colorful.”

In (b), all idioms except for the last one were used correctly. The last idiom, *chazi yanhong* 姹紫嫣红 “very beautiful (flowers),” is usually used to describe flowers in various colors or a situation with a great many possibilities. Another problem with (b) is of lexical style. *Jianqiang buqu* 坚强不屈 means “very firm and refusing to yield,” which is usually used to describe heroes, especially war heroes. Thus, it is not appropriate to use *jianqiang buqu* to depict the officials. Moreover, even though the other three idioms were used correctly in each specific sentence, the individual sentences were not coherently connected in the paragraph. The coherence problem alerts us to the importance of the intervention of instructors when this kind of learning activity is being conducted in class. Instructors should step in and talk about the stylistic features of the vocabulary, and textual coherence, if necessary.

### Students’ Feedback about the Learning Experience

**Overall Impression.** Most students responded positively to this activity. Students commented “this is a good activity to learn idioms”; “it was fun”; “I really enjoyed it and think it is a good way to learn, and it does not just involve memorizing words”; “it is a good activity to learn idioms”; “it was fun to play around on the iPad to learn in a different way than reading from a book”; “it was fun getting to figure out different applications”; “it was fun to try something new and use the technology, I enjoyed googling for pictures and definitions”; and “it was fun to learn new idioms, some of which struck in my brain.” However, one learner who did not enjoy this activity that much said that “I value learning [Chinese] idioms. I wish it were more in-depth; the background is important. I would have preferred a focus on the story behind it.” Many Chinese idioms are derived from historical stories, fairy tales, and ancient legends/stories. However, the idioms chosen in this project do not fall within that category and were mostly not related to any such stories. Future studies should investigate how well students learn idioms within stories.

**Challenges Students Faced.** Another question was asked in the questionnaire to seek students’ feedback about the challenges that they had in this activity. Most students reported that the 50-minute in-class time was not enough to complete the six idioms due to the limitations of the iPads. The most commonly reported challenges were the difficulty in typing (as can be seen in the typos in (a) above) on iPads and the difficulty of copying and pasting both texts and pictures on iPads. As a result, one student even commented that “using computers instead of iPads might be better.” Admittedly, if computers were used in the study, it would be convenient for students to type, copy, and paste pictures. However, the purpose of this study is to examine the effectiveness of the use of the latest tablet technology, namely, iPads, in learning Chinese idioms, and to provide directions for the next cycle of action research. More importantly, the use of iPads enabled learners to engage in mobile and collaborative learning.

The analysis of learners’ feedback shows that most students enjoyed and benefited from the self-generated collaborative learning of Chinese idioms through iPads although they reported some problems and challenges in using iPads. The iPads were found to have constraints in the present study, such as

difficulty in picture copying and pasting, and Chinese character input, though there is no denying that iPads would be a great tool in other collaborative activities, such as video projects (For example, instructors could ask students to shoot video clips with iPads in or outside class to explain the meaning of idioms and to illustrate the usages of idioms by performing skits or short plays.). Even so, most students enjoyed this activity and would like to do more such activities. They commented, “we should continue but for fewer idioms and give us more time”; “we should have done this more.” Students’ feedback also suggest that it might be more advisable to give students more time to do a series of semester-long activities, and ask students to learn from and comment on each other’s artifacts as well.

## REFLECTIONS, LIMITATIONS, AND DISCUSSION

In this action research study, the researchers examined the short- and long-term effect of the self-generated learning of Chinese idioms by Chinese heritage learners. Students worked in pairs to generate the meanings, provide visual illustrations, and make up sentences with the six assigned idioms. The dual-coding of Chinese idioms by textual and visual mnemonic cues strengthened the learners’ memory and understanding, which proved to be very effective in helping heritage learners learn and recall the idioms, as shown in the immediate test. Even two weeks after the immediate test, the learners still retained 40% of the idioms that they had worked on. Because of the limited number of participants in the study, the researchers were not able to compare the effect of self-generated learning with other instructional strategies. However, since the strategy was well established and tested for Chinese learning in other studies (see Kuo and Hooper, 2004), this study contributed to the literature by examining the short- and long-term effect of this strategy. In addition, this study also extended previous findings about dual-coding theory to Chinese idiom learning. According to Paivio (1986), dual coding is more likely to occur when the content is highly imaginable. This study for the first time distinguished concrete and abstract idioms and attested the effect of dual coding theory on students’ learning of different kinds of idioms. As stated above, the retention test shows that the concrete idioms were stored longer and more easily than the abstract idioms, which echoes the findings of Kuo and Hooper (2004). The reason underlying this is that the meanings of the concrete idioms are more easily guessed from the literal meaning of the characters in the idioms, such as in *renliu ruzhi*.

Qualitative analysis showed that most of the idioms were used correctly. It suggested that students have grasped the meaning of these idioms through these self-generated learning activities. However, it seemed that there was still a gap between comprehension and application of these idioms. For example, four idioms were used incorrectly in (a) and (b). The nature of referring to physical objects seemed to enhance retention of the meanings of the concrete idioms but did not help with the application of such idioms. The misuse of the four idioms mostly had to do with when and where they should be used. To bridge this gap, more instructional strategies (such as encouraging students to search the assigned idioms in context and summarize when and where to use them) and instructor’s interventions are needed.

This study highlighted three key areas that should be addressed in the next cycle of action research. These areas include learner collaboration, peer learning and assessment, and technological issues. In terms of learner collaboration, even though learners benefited from the self-generated process of learning Chinese idioms with iPads, little learner collaboration was observed in this cycle of action research. Thus, collaboration should be a key area in the next cycle of action research. Even if technological collaboration cannot be achieved, such as simultaneously editing the same document, learners should be encouraged to engage in other forms of collaboration, such as in negotiating how to best represent the idioms visually and how to incorporate idioms in a story. Considering peer learning and assessment, in the next cycle of action research, learners should participate in peer learning and assessment. They should learn from other groups’ artifacts and assess their work at the same time. It is expected that through such peer learning and assessment, learners will not only expand their idiom learning, they will also develop skills of critical thinking. Finally, concerning technological issues, the present action research study has identified some



challenges that learners confronted when iPads are used for learning Chinese idioms. These challenges should be taken into account when the next cycle of action research is designed. To solve the difficulty in input, stylus pens could be provided to learners. With respect to the difficulty of uploading pictures on iPads, learners should be encouraged to take advantage of high-definition cameras in iPads to take pictures or shoot short video clips to illustrate the idioms.

## CONCLUSION

In this paper, we reported on the first cycle of an action research study using iPads in teaching Chinese idioms to Chinese heritage learners. The results showed that the textual and visual illustrations of the idioms by the heritage learners facilitated their idiom learning and that learners enjoyed this mobile way of learning. The present study also helped identify three key areas of issues to be addressed in the next cycle of action research, namely learner collaboration, peer learning and assessment, and technological issues as described above.

It is acknowledged that the self-generated learning discussed in this paper is not really mobile learning in that the learning takes place in class. Moreover, only one-hour class time was devoted to the self-generated learning of Chinese idioms. Ideally, a longitudinal study would shed more insight into the use of iPads in the self-generating learning of idioms by Chinese heritage learners. In spite of this, this action research study exemplifies a case of using the latest technology in language learning. The self-generated experience provides much freedom for learners in which they can take control of their own learning. On the other hand, this type of learning appeals to the new generation of technology-native learners. The initial success obtained from this study can be easily transferred to a real mobile learning environment, such as asking students to look for opportunities in their real life to learn and use idioms and report back to the web-publishing tool with iPads at any time. More importantly, this action research study provides the directions for the future cycles of action research along the same line.

## APPENDIX. Idioms Used in the Study

	Abstract	Abstract	Abstract	Concrete	Concrete	Concrete
1	平易近人	鬼鬼祟祟	克己奉公	人流如织	鬼鬼祟祟	克己奉公
2	大义凛然	战战兢兢	坚强不屈	门庭若市	战战兢兢	坚强不屈
3	宽宏大度	风风火火	不屈不挠	万人空巷	风风火火	不屈不挠
4	意气风发	原原本本	格格不入	人头攒动	原原本本	格格不入
5	落落大方	形形色色	忐忑不安	熙熙攘攘	形形色色	忐忑不安
6	博大精深	林林总总	万无一失	水泄不通	林林总总	万无一失

## NOTES

1. This study was supported by the WCAS Hewlett Fund for Curricular Innovation at Northwestern University.

---

## REFERENCES

- Bellezza, A. S. (1981). Mnemonic devices: Classification, characteristics, and criteria. *Review of Educational Research*, 51(2), 247–275.
- Chinnery, B. H. (2006). Going to the MALL: Mobile assisted language learning. *Language Learning and Technology*, 1, 9–16. Retrieved from <http://llt.msu.edu/vol10num1/emerging/default.html>
- Coghland, D., & Brannick, T. (2010). *Doing action research in your own organization* (3<sup>rd</sup> ed.). London, UK: Sage Publications.
- Duff, P., & Li, D. (2004). Issues in Mandarin language instruction: Theory, research, and practice. *System*, 32(3), 443–456.
- Fallakhair, S., Pemberton, L., & Griffiths, R. (2007). Development of a cross-platform ubiquitous language learning service via mobile phone and interactive television. *Journal of Computer Assisted Learning*, 23(4), 312–325.
- Kemmis, S., & McTaggart, R. (Eds). (1988). *The action research planner* (3<sup>rd</sup> ed.). Geelong, China: Deakin University Press.
- Kuo, W.-L. A., & Hooper, S. (2004). The effect of visual and verbal coding mnemonics on learning Chinese characters in computer-based instruction. *ETR&D*, 52(3), 23–38.
- Kukulka-Hulme, A. (2005). The mobile language learner—now and in the future. Fran Vision till Praktik. Language Learning Symposium conducted at Umea University in Sweden. Retrieved from <http://www2.humlab.umu.se/symposium2005/program.htm>
- Kukulka-Hulme, A., & Shield, L. (2006). *Researching new and emerging technologies in language education*. Unpublished presentation to internal Open University, UK INTELLECT research group.
- Lei, J. (2006). Language socialization as social practice: Case studies of a Chinese heritage language school. Presentation at the 27<sup>th</sup> Annual Ethnography in Education Research Forum. University of Pennsylvania.
- Luk, R. W. P., & Ng, A. B. Y. (1998). Computer-assisted learning of Chinese idioms. *Journal of Computer Assisted Learning*, 14, 2–18.
- Mishan F. (2005). *Designing authenticity into language learning materials*. Bristol, UK: Intellect Books.
- Nation, P. (2001). *Learning vocabulary in another language*. Cambridge, UK: Cambridge.
- Nunan, D. (1992). *Research methods in language learning*. Cambridge, UK: Cambridge.
- Paivio, A. (1986). *Mental representations: A dual-coding approach*. New York, NY: Oxford.
- Rieber, L. P., & Kini, A. S. (1991). Theoretical foundations of instructional applications of computer-generated animated visuals. *Journal of Computer-Based Instruction*, 18(3), 83–88.
- Sadoski, M., Goetz, E., & Avila, E. (1995). Concreteness effects in text recall: Dual coding or context available? *Reading Research Quarterly*, 30(2), 278–288.

- Sadoski, M., Paivio, A., & Goetz, E. (1991). A critique of schema theory in reading and a dual coding alternative. *Reading Research Quarterly*, 26(4), 463–484.
- Sharples, M. (2006). Big issues in mobile learning: Report of a workshop by the Kaleidoscope Network of Excellence Mobile Learning Initiative. *LSRI*. University of Nottingham, UK.
- Tin, S. L. (1989). A preliminary investigation of Hong Kong secondary students' vocabulary learning. *Language Teaching in Bilingual and Multilingual Environment*, 117–129.
- Traxler, J. (2005). Mobile learning: It's here, but what is it? *Interactions*, 9(1), 1–12.
- Wallace, M. J. (1998). *Action Research for Language Teachers*. Cambridge, UK: Cambridge.
- Wang, A. Y., & Thomas, M. H. (1996). Mnemonic instruction and gifted child. *Roeper Review*, 19(2), 104–105.
- Wittrock, M.C. (1989). Generative processes of comprehension. *Educational Psychologist*, 24(4), 345–376.
- Wittrock, M.C. (1992). Generative learning processes of the brain. *Educational Psychologist*, 27(4), 531–541.
- Wong, L.-H., Chin, C.-K., Tan, C.-L., & Liu, M. (2010). Students' personal and social meaning making in a Chinese idiom mobile learning environment. *Educational Technology & Society*, 13(4), 15–26.
- Zhong, J. & Majchrzak, A. (2004). An exploration of impact of cognitive elaboration on learning in ISD projects. *Information Technology and Management*, 5, 143–159.