

Learning Chinese vocabulary through Mobile-assisted activities: An investigation in China

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Abstract

Mobile-assisted language learning (MALL) has seized the attention of language learning for almost twenty years. A reasonable amount of studies on the effects of MALL in a wide array of contexts has been conducted. However, most research focused on behaviorist, teacher-centered, tutorial drill applications, rather than pedagogical perspective where mobile devices can enable learners to traverse the formal and informal learning contexts, physical world and cyberspace as well as personal and social learning spaces. This study aims to examine the efficiency of a mobile-assisted seamless learning (MASL) on Chinese as a foreign language through mobile-assisted seamless learning activities for beginner-level undergraduates. The findings demonstrated that the designed mobile assisted seamless learning activities had a positive effect on enhancing Chinese vocabulary learning for the beginner level learners, in addition to the enhancement of students' perception of usefulness of mobile devices for language learning.

Keywords

Mobile-assisted; learning activities; Chinese vocabulary learning

1. Introduction

Since the advent of computer-based, hand-held mobile devices, attention has shifted to the mobile devices as the vehicle of mobile learning. Within the specific context of mobile learning, mobile-assisted language learning (MALL) that stemmed from computer assisted language learning (CALL) seized the attention of language learning with its notable feature "anytime, anywhere" as learning principle (Kukulsak-Hulme & Shield, 2008). As Kukulsak-Hulme (2009) states that "mobile technology can assist learners at the point of need and in ways that fit in with their mobile lifestyles" (p.162). Godwin-Jones (2011) further suggests that "mobile devices integrate real-life interests and academic roles" on learning. He noted that the characteristic of MALL would eventually improve "learner autonomy" (Benson, 2007), which indicated the learners' learning responsibility would increase in this learning process. Stockwell (2007) considers that studying MALL is a natural path of computer-based learning research in light of the current situation where "technologies themselves are becoming more pervasive, and the number of students who own mobile technologies is increasing at an impressive rate".

With the enormous improvement on capability of mobile devices, a reasonable amount of research on the effects of MALL in a wide array of contexts has been conducted, including the areas of reading (e.g., Kondo et al., 2012; Lan, Sung, & Chang, 2007) speaking and listening (e.g., Demouy & Kukulska-Hulme, 2010), and vocabulary (e.g., Chen & Chung, 2008; Wong & Looi, 2010). Mobile technology is making inroads into classroom environments and our daily lives at a rapid pace (Kukulska-Hulme, 2009). However, the research into MALL has not kept up with the speed of technological development (Ballance, 2012). As previous reviews have demonstrated (Burston, 2014; Kukulska-Hulme & Shield, 2008), MALL has been largely focused on behaviorist, teacher-centered, tutorial drill applications, rather than pedagogical perspective where mobile devices can be effectively exploited to adapt the curricular instruction to the learners' real-world setting. Burston (2014) did a comprehensive review of current research on MALL and found that over 90% of the MALL research has been focused on the use of mobile devices in out-of-class learning. Only about 20 MALL research studies have focused on the in-class usage of mobile devices.

Given the 'anywhere anytime' nature, mobile devices have the potentials to break classroom constraints (Chan, et al., 2006; Wong, Chin & Hsieh, 2011). Mobile devices enable learners to traverse the formal and informal learning contexts, physical world and cyberspace as well as personal and social learning spaces. The portability of mobile devices and the multi-function of mobile devices afford spontaneous, seamless learning experience that connects in-class and out-of-class learning. It is acknowledged that the informal experiences outside the classroom would offer as meaningful learning opportunities as the formally structured learning environment established within schools. The outside classroom learning experience can strengthen the classroom learning by applying the learning context to other different environments. Besides, learning that takes place outside the classroom can become a relevant part of an extra learning context to classroom instruction.

Therefore, much greater research efforts are needed to examine the efficacy of mobile devices in bridging in-class and out-of-class learning to create coherent and seamless learning experience (Wong & Looi, 2010). This study aims to fill in this research gap by investigating the Chinese learning effectiveness through a mobile-assisted seamless learning activity.

2. Literature overview

2.1 Mobile learning

Mobile learning (M-learning) concerns the acquisition of knowledge through a mobile device. Sharples (et al., 2007, 225) defined mobile learning as a "process of coming to know through conversations across multiple contexts among people and personal interactive technologies". Thus, mobile learning refers not only to the technical aspects, learning facilitated by any kind of handheld mobile devices, but also to the pedagogical aspects, learning across different learning contexts. Research on mobile learning has gone through three generations of development (Yu, 2007) : 1) The first generation focuses on transferring learning content onto mobile devices based on behaviorism; 2) the second generation focuses on pedagogical design standing with the constructivism and cognitivism; and 3) the third generation is characterized by 1:1 (one-mobile-device-per-learner) setting and the use of context-aware technology. The essence of the third generation of mobile learning is about "increasing a learner's capability to physically moves their own learning environment as they move" (Barbosa & Geyer, 2005). Thus, the third generation of mobile learning is creating the impact of stitching the learners' formal and informal contexts together to lead towards seamless learning and making learning experience more personalized for the individual.

Fransen (2008) presents an overview of the potential advantages and disadvantages of mobile learning. According to his statement, the accessibility to learn what, where, when and how one likes are the major advantages. Another visible advantage is the possibility to adapt learning content to the context where the learner finds him or her to be. However, Fransen (2008) stresses the fact that very little research has been

conducted to examine the effectiveness of mobile learning. His argument is concurred by Taylor and Vavoula (2007) who observed that most studies of mobile learning focus on students' perceptions collected via surveys, which were not methodologically sound and led to many insignificant results. Thus, more rigorous research design is needed to examine the efficiencies of mobile-assisted learning.

2.2 Mobile assisted language learning (MALL)

Language educators have been quick to seize the potentials of mobile devices for language learning. There have been more than 100 research studies on mobile assisted language learning (MALL). Buston (2014) reviewed current studies on MALL and found that these studies could be mainly categorized into six types: mobile phone-based applications, PAD-based applications, media player applications, Web-based applications, smartphone applications, and phone-based communication applications. All these applications were used for both first language learning and second language learning.

Earlier MALL studies have examined linking wireless application protocol (WAP) to web based resources. The earliest and most ambitious experiment was undertaken in Spanish learning program in US, where university students could use e-mail, voice and voice recognition to provide vocabulary practice and phrase translation as well as access to live talking tutors (Brown, 2001).

As more sophisticated technologies applied on mobile devices, MALL applications that involved with more functions than message texting were implemented on PDAs. The addition of a camera and wireless phone, PDAs were used for facilitating students who learned English as second language by sending location-related text and images through short message service (SMS) and multimedia message service (MMS) to a web-based multimedia message board (City College Southampton, 2005). Numerous studies were undertaken in Japan not only by using accessible multimedia resources on PDAs, but also radio frequency identification devices (RFID) to tag readers' capability to identify the objects in the environment to support the in-context learning of vocabulary (e.g., Hou, Ogata, Miyata, 2008). As the large scale of mobile devices provided media player, many exploitations of MALL involved audio-based programs stemming from the introduction of the iPod into academia. The studies of the give-away of iPods to undergraduate students at Osaka Jogakuin College in Japan in 2004 and at Duke university in 2005 had a general interest in using podcasting as a language learning tool, especially for listening comprehension activities (Andrew Oberg & Paul Daniels, 2012).

When mobile phones' in-built ability was increased to access the Internet, MALL applications of Web-based mobile phone were tutorial in nature, targeting vocabulary and grammar (e.g., Stockwell, 2007; Tschirhart, O'Reilly, & Bradley, 2008), and listening comprehension (e.g., Nah, 2011) and pronunciation (Saran et al., 2009) and reading (Huang & Lin, 2011). The smartphone applications were involving picture taking and voice recording resulted from the increasing multimedia capabilities of mobile phones. (e.g., Gjedde & Bokristensen, 2012; Liu & Chen, 2012). Besides, the vocabulary games (e.g., Amer, 2010) and multimedia tutorial programs (Burston, 2012; Salameh, 2011) were available on smartphone, due to the development of programming on mobile phone operating systems.

With the prices falling and functions increasing, mobile phones are nearly everywhere, and its communicative potential has been used to convey information in daily lives. However, only a handful of published MALL studies involve the use of mobile phones for their intrinsic purpose as a communication device (Brown, 2011). Nearly all these studies were based on the commercial language learning system, such as Learnosity system, which offers an audio server and recording their responses to promote the learners' language communication skill via mobile phone (e.g., Robertson et al., 2009). Current research on MALL has examined the effects of mobile assisted learning on the development of different language skills. The majority of current MALL research focused on vocabulary learning via mobile device, taking up 45% of current MALL studies, and listening comprehension and speaking represented relatively moderate rate approximately 21 % in total, with the rest exploring the learning of Grammar, pronunciation, writing,

community building and culture (Burston, 2014). Mobile devices have been found to benefit the acquisition of Japanese Kanji (Lin, Kajita, & Mase, 2007,2008;Lin & Mase, 2006). PDA based speech-recognition program which was designed to provide English as a second language learners oral practice in a game-based environment has been found to benefit oral proficiency development (Yang, Lai, & Chu, 2005), and mobile devices have been used to support learner-made audio dairies and audio blogs (Belanger, 2005; Hsu, Wang, & Comac, 2008). Albeit with the pitfalls of mobile devices, known as small screen, limited input option and low computational power, reading comprehension and grammatical rules still can be acquired on mobile learning through well-designed learning course and specifically designed programs installed on mobile devices (Miangah and Nezarat, 2012). Chen and Hsu (2008) presented a personalized, intelligent mobile learning system known as PIM, which provided English news articles based on learners' reading abilities.

The result of experiment indicated that such an approach promoted learners' reading comprehension and abilities very effectively. Despite of the positive links between MALL and language education that current research has established, most of these studies are based on teacher-centered approach, which led learners to work on targeted content areas of language, especially vocabulary acquisition (Burston, 2014). The MALL application has continued the emphasis of content delivery within an implicitly behaviorist framework. The text-based tutorial applications which involved drill and repetition of the type advocated by B.F. Skinner (1957) have been the norm continuously. Burston (2014) lamented that the integration of MALL into language curriculum has been largely constrained to behaviorist, teacher-centered, tutorial applications, most of studies placing excessive attention on the mobility of technology, rather than the learner's mobility. However, MALL implementation should shift to "the interactions between learning and technology, with learners opportunistically appropriating whatever technology is ready to hand as the move between setting, including mobile and fixed phones, their own and other people's computers, as well as books and notepads" (Sharples, Taylor & Vavoula, 2005, p.5)

2.3 Mobile-assisted seamless learning (MSL)

Pertaining with the paradigm shift in language learning theories from behaviorism to a communicative and authentic learning approach, mobile assisted language learning is shifting from content-based delivery of relatively static learning content through mobile devices to design-oriented authentic or social mobile learning activities. (KuKulska-Hulme & Shield, 2007). There have been a few studies that examined the use of mobile devices to create authentic or social mobile learning activities. The first attempt was the LOCH project where Japanese as a second language learners were given tasks that required them to use the language in real-life situations, such as doing grocery, interviewing native speakers, gathering information, then shared all the collective information with others using PDA based text and voice communication (Ogata et al., 2006; Paredes et al., 2005).

The other project designed for learning English as a second language named handheld English language learning organization (HELLO) prototype also did likewise to foster real world communication to support English listening and speaking for English as a second language learners. The activity was follow-up with treasure hunts and engaged in relay races required learners working in small groups to send out for seeking the treasure guided by the maps on their PDAs where virtual dialogue practice and collaborative story creation recorded. As technology improved, interactionist methodological approaches, task-based teaching method and collaborative learning principle were involved MALL application.

In a more recent project (Tai, 2012), researchers attempted to use smartphones in English as a second language curriculum as part of a classroom response system to prepare for out-of-class tasks, such as tracking down the culprit in the scene of an imaginary burglary. In such tasks, learners could use their GPS-equipped mobile phones to collect and share the Internet-based data and communicate with other students and their teachers to obtain information from peers and specific instructions from teachers. When the learners come back to class, they could review, compare all the collected resources and discuss their solutions. Some projects attempted to form a personalize instruction by creating a learning environment adhered to the

situated learning theory (Brown ,Collins, & Duguid, 1989). In server-based systems, delivering content in the physical location of learners has been developed. The Tense LTS project was illustrated this theory by the design that learners addressed their specific location to the mobile devices when they logged into the program, which determined the duration and complexity of instruction received. It would provide a short review module while the learners were waiting for a bus, and a longer and more complex lesson while it logged in the library (Gui & Bull, 2005). With the Global positioning system (GPS) technology being more developed and advanced, a number of programs have exploited location-aware devices to tailor learning to the physical surroundings, such as contextualise vocabulary acquisition has been implemented into the CLUE system (Ogata & Yano, 2003, 2004a) , as well as MicroMandarin system (Edge, Searle, Chiu, Zhao, & Landay, 2011). Due to the distinctive feature of GPS technology, a few research designs exploited to collect and share data in real life situations in order to support communicative competence in the language-learning outside the classroom with mobile devices, such as personalized context-aware ubiquitous learning system (PCULS) which adapted the wireless area network to match students' location to vocabulary learning initially (Chen & Li, 2010), LOCH program which was mentioned above and the ubiquitous computer-supported collaborative learning (UCSCCL) prototype (Cheng, Hwang, Wu Shadiev, & Xie, 2010).

However, the potentials of mobile devices not only lie their potentials in creating authentic learning experience, but also in bridging classroom language learning with out-of-class language learning, namely, to create seamless learning environment that integrates formal and informal language learning. With proper learning designs, the mobile devices could transform the formal learning activities that take place in classroom into a more social and personalized context, facilitate learner's involvement and reflection and target language use across different learning spaces. Learners engaged in such a learning environment need to process and associate their experiences or the informal context with the knowledge that they acquired in the classroom, practice their language knowledge for communication, articulation of thoughts and productions of linguistic artifacts. The situated learning gains can be generalized in the class when the learners come back, thus the seamless learning cycle is completed (Wong, Chin, Chai, & Liu, 2011). The out of classroom context would strengthen the classroom learning and deepen the understanding of the indirect and abstract language knowledge.

Wong & Looi (2011) defined seamless learning mediated by one-mobile-device-per-learner, referred to the seamless integration of the learning experiences across various dimensions including formal and informal learning contexts, individual and social learning and physical world and cyberspace. In the learning process, mobile devices carried by the seamless learners could function as a "learning hub" (Looi, et all...2009) or the technological interface between learners and their learning environments (Bentley, Shegunshi & Scannell, 2010) for experiencing or enacting seamless learning. Combining with the research in wireless, mobile and ubiquitous technology in education, Wong & Looi (2011) identified ten dimensions which characterize mobile-assisted seamless learning, ranging from encompassing formal and informal learning to ubiquitous knowledge access, encompassing physical and digital worlds, and combined use of multiple device types.

Whereas the arguments for the potentials of mobile devices in facilitating seamless language learning, dishearteningly little research has been conducted to examine the efficacies of substantial curricular integration of MAL, which is argued to be the direction where MALL research needs to shift towards in the future (Burston, 2014).

This study attempted to examine the efficiency of a mobile-assisted seamless Chinese learning activity among college students who learned Chinese as a foreign language. The specific research question of this study is that: What is the effectiveness of mobile-assisted seamless learning activity with pedagogical design on beginner-level learners? The research hypothesis is that students who participate in the seamless learning activity would outperform students who just attend regular classroom Chinese lesson.

3. Methodology

This study adopted a quasi-experimental design: experimental group would participate seamless learning activity with their mobile devices, while control group only attended regular classroom leaning without mobile devices.

3.1 The seamless learning Design

The seamless learning activity focused on contextual study and contextual use through activities in classroom and out of classroom. The design took reference of previous seamless learning research studies (Burston,2009; Wong,Chai,Chin Hsieh &Liu,2011)with the goal of providing more opportunities to practice Chinese vocabulary in ubiquitous real-world learning environment with accessible mobile device. The process of the activity consisted four steps as follow.

Firstly, in-class contextual learning. It occurred in traditional classroom learning with the characteristics of physical and social learning space in formal setting. The teacher gave introductions of vocabularies through multimedia presentation to assist the students in understanding the initial link of form and meaning. After that, the teacher arranged some contextualise learning activities, such as matching characters to the related Pinyin and meaning, guessing the words by the given pictures or photos, composing sentences with given words, with the last two activities being carried out by collaborative learning groups. In seamless learning cycle, this was an important step for preparing and motivating learners to engage in subsequent out-of-class activities.

Secondly, out-of-class contextual, independent artifacts making with photos. In this step, students identified or discovered contexts that related to the vocabularies which they have learned on the class, then took photos by their mobile devices, made artifacts with the vocabulary of the target lesson, finally, they sorted up their artifacts and reviewed them. This step was considered as the most vital section in the entire seamless learning cycle, which is characterized physical, individual and productive learning through informal setting.

Thirdly, out-of-class, online collaborative learning. Students selected some of their artifacts to post on their We Chat, a widely-used social network software in China, other students reviewed others' artifacts, gave comments, and discussed with the authors. The teacher also involved in the on-line group chatting as one of common reviewers. This section was implicated by social theory and collaborative theory.

Finally, in-class consolidating presentation. The students gave presentations associated with their artifacts in the class, through demonstrating their photos on screen, reading the sentences, introducing the background of the photos and answering teacher's questions related to their artifacts. The teacher summarized the students' artifacts and consolidated the vocabularies of the target lesson afterwards. This step was to close the loop of seamless learning cycle, aimed to feed the students' situated learning gains back to the formal class for generalization of the lesson.

3.2 Participants

The participants were recruited from two Chinese beginner classes for international students learning Chinese as a foreign language at a large prestigious university in China. The selection criteria were that the two classes were taught by the same instructor, used the same language curriculum, and the students were of comparable demographic backgrounds and language learning backgrounds.

A total of 47 participants came from Africa countries, had similar language and culture background, as well as learning motivation. Their average age was nineteen years old. They were from English-media program, majored in International Trade, Computer Science and Foundation Engineering respectively. 25 students

from one Chinese class would like to join in this experiment with their mobile devices, were assigned to be experimental group, the rest 22 students in the other class were willing to participate without their mobile devices were assigned to be control group. Both groups received the Chinese lessons with the same the learning agenda and material given by the same teacher.

3.3 The two treatment conditions

This study started with pre-test of their Chinese level after collecting participants' demographic data via the questionnaire. Subsequently, the two learning conditions were implemented. Both of two groups had four sections class per week, and every section lasted 50 minutes. The entire learning context was arranged in two weeks with the same pedagogical vocabulary requirements.

The participants in experimental group engaged the out-of-class activity after receiving first Chinese lesson instruction. They started making artifacts and posted on We chat, discussed the artifacts with other classmates every day until they gave their presentations on the class.

Meanwhile, the control group attended regular Chinese lessons in the classroom without any learning activity beyond formal setting.

3.4 Measurement: The pre-test and post-test

The measurement of the learning outcome focused on Chinese lexical knowledge comprehension.

Some researchers (Richards,1976; Ringbom, 1987;Nation, 1990; 2001) claimed that “knowing a word involves a range of inter-related ‘sub-knowledge’, such as morphological and grammatical knowledge and the knowledge of word meanings”, thus, tests of lexical knowledge often focus on ‘sub-knowledge’ and production of meaning (Laufer and Nation, 1999), vocabulary use (Arnaud, 1992; Laufer and Nation, 1995) or word associations (Read,1993).

As Read and Chapelle (2001: 23) argued: “Vocabulary assessment should go beyond decontextualized word lists and should be generated positive wash back on the teaching an learning process”, coupling with the actual level of the students and the pedagogical requirement of vocabulary, the test would employ these various vocabulary texts in a different way. The tests in this study incorporated two aspects of vocabulary assessment; the pre-test focused on the size of vocabulary and the strength of vocabulary of high frequency words; while the post-test focused on the strength of vocabulary of the target learning unit.

To ensure the validity and reliability of the tests, the assessment of vocabulary adopted Computer Adaptive Test of Size and Strength (CATSS),with the database of 56300 Chinese words formulated by two official resources, namely: 现代汉语常用词表 (High-Frequency Chinese words list, the Commercial Press, 2008) and HSK 基础级词汇 (HSK basic-level vocabulary, the Board of HSK Examination Office, 2001). Two kinds of vocabulary sources at the same level blended by the rate as 3: 7 without duplicates. Considering to the small vocabulary size of the test-takers, the basic level vocabulary was the mainstream in the pre-test. The post-test aimed to measure the strength of vocabulary in the current unit. Therefore, all the vocabularies of the target unit were the majority of the database, with a small number of High-Frequency Chinese words and HSK basic-level vocabulary, they were occupied approximately at the rate of 8:1:1.

As Laufer (2004) stated, there are four degrees of knowledge of meaning, based on two dichotomous distinctions in terms of supplying the form for a given concept vs. supplying the meaning for a given form; and recalling vs.recognizing forms or meanings. Coupling with the characteristic of Chinese words, the types

of the tests' questions illustrated this concept with four types of questions: 1). Complete the words for the given radicals or components, which is based on active recall; 2). Choose the proper word for the given English definition according to passive recall; 3). Choose the target word for the picture from four options which are from the same frequency level as the target word, illustrated active recognition; 4) Choose the meaning of the target word from four English definitions (serve as paraphrases), known as passive recognition.

3.5. The questionnaires

Two questionnaires were used in this study. The first one was for collecting the basic demographic information of all the participants including three sections, in terms of basic information, for instance, age, nationality and so forth; language background, such as first language and second language; learning motivation. This questionnaire was administered at the beginning of the experiment.

The other two questionnaires were assigned to assess the perception of mobile assisted seamless learning activity, and the attitude to mobile assisted seamless learning in the future, including pre-activity survey and post-activity survey. These questionnaires were administered to the experimental group only. Four points Likert-type scale was adopted in the questionnaires.

4. Procedure

According to the design, this study started with assigning the first questionnaire of basic demographic information of all the participants. The experimental group took the pre-activity survey. All the participants took the pre-test afterwards. Then both experimental group and control group attended regular Chinese lesson, the experiential group joined in the seamless learning activity out of class as the design illustrated before. The post-test was assigned when the learning activity was completed, the post-activity survey was administered to the experimental group after the post-test.

In this study, participants in experimental group contributed a total of 127 artifacts. The processes of these artifacts could be categorized into three dimensions as Wong(2011) suggested, namely, "types of physical setting" "types of meaning making" and "types of cognitive process in artifact creation". All the artifacts covered 33 vocabularies of target learning unit, about 81 artifacts were associated with the physical setting, and 29 artifacts could be categorized as the type of meaning making, and 17 artifacts were the type of cognitive process. Here are some students' artifacts, these artifacts centralized with the vocabularies: 这是(this), 大(big) and 他们(they).

5. Data Analysis

To compare the learning outcomes of the two treatment conditions, Mann-Whitney test was used to evaluate the differences between the two groups in pre-test and post-test.

Table1. Tests score

Group statistics	Control group	Experimental group
N	22	25
pre-test Mean	8.865	8.7111
pre-test Standard deviation	8.77	9.07
post-test Mean	8.345	9.033
post-test Standard deviation	15.46	8.62

A significant difference between control group and experimental group was revealed by the Table1, the data of post-test shown that the mean score of experimental group was 9.033, which is much higher than the control group of 8.345. It indicates that after the seamless learning activity, the participants' learning effect has been improved. Coupling with the post-test standard deviation of the experimental group, which was smaller than the pre-test standard deviation, these indicators suggested that the experimental group's score performance became tighter around its mean.

Meanwhile, from the pre-test data, the mean of control group was 8.865, which was slightly higher than the experimental group, and the standard deviation of control group was smaller than the experimental group, all these data indicate the control group had a better Chinese level than the experimental group, albeit the difference was not very noticeable.

In post-test, the standard deviation of control group became larger, which meant that some of the participants did quite well, while some did not, though the overall performance in the post test was not very good, much lower than the pre-test.

A further test statistic analysis illustrated the alpha levels set for both tests were 0.047, the pre-test the two-tailed significance score for the equality of means was 0.078, and the Mann-Whitney produced a further two-tailed significance score was 0.092. The Mann-Whitney(p) of pre-test was higher than the alpha levels. The effect size of the comparison between the two means was 0.323, which showed that there was no significant difference between the control group and the experimental group.

The two-tailed significance score for equality of means of the post-test was 0.0046, with the supporting Mann-Whitney score(p) 0.0046, the Cohen's d was 0.413. Both two-tailed significant score and Mann-Whitney score were much lower than the alpha level. Therefore, a significant difference between the two groups has been shown. Comparing with the number of pre-test, the effect size also increased, indicated that the out-of-class activities improved the scores.

Table 2. Perception of Mobile-assisted seamless learning activity

Mobile assisted learning activity to learn Mandarin	pre-activity survey Mean	pre-activity survey Standard deviation	Post-activity survey Mean	Post-activity survey Standard deviation
This activity are helpful to learn the vocabulary of the lesson.	2.91	0.89	3.32	0.95
This activity are helpful to learn some other Chinese knowledge.	2.63	0.92	3.15	0.83
I will learn/ learned this lesson better with this activity.	2.85	0.91	3.83	0.81
I would like to participate such kind of activity in the future.	3.01	1.00	3.31	1.03

These data were analyzed and yielded a Cronbach Alpha coefficient of 0.85, which was in the acceptable scope of survey reliability (Lim, Khine, Hew, Wong, Shanti, & Lim, 2003). All the students in experimental group had a not-bad and try-and-see impression of mobile devices in language learning before they joined in this activity. After participating this activity, their perception of the usability of the mobile-assisted learning out-of-class activity demonstrated very positive. It is striking to identify that from the third item, with the highest mean of 3.83, and the lowest standard deviation of 0.81. This result was also supported by the number of post-test score (table 1). Many students perceived the vocabulary of the lesson very well, as the mean of the first item showed. However, the mean of the second item was the lowest, and the standard deviation showed also quite low, which indicated that the students did not consider this activity would facilitate other Chinese knowledge learning. The data of last item indicated that many students would like to join in seamless learning activity in the future.

6. Limitations

Although the results of the study showed promising, this study has a number of limitations. The duration of the study was limited. The small sample size was very small. The type of measurement was limited, it would be better to assess the effectiveness of this activity with a delayed test. In the future work, more precise and additional measurements should be introduced to explore the effects of Chinese seamless learning activity.

7. Conclusion

This study incorporated pedagogical design with Wong's MyCLOUD (2011) seamless learning model for beginner-level students in university. Albeit many mobile devices have involved in language learning in the last two decades, the majority of Mobile assisted language learning applications have still focused on structuralist vocabulary and grammar tutorial drill activities. Very few of them made use of the advantages of mobile devices—the mobility, peer connectivity and advanced communication (Godwin-Jones, 2011), which would integrate the problem-solving tasks into a curriculum (Tai, 2012). As Burston (2014) stressed, the

future of mobile assisted language learning lies in the exploitation of the ubiquitous mobile devices in ways that support collaborative, task-based learning bridging the classroom learning and out-of-class learning. This study attempted to fulfill the fringe of mobile assisted language learning with a seamless learning activity. Although a few researchers (e.g. Wong, Looi, Chai et.2011...) have invested such a learning cycle can yield fruitful achievement for advanced level elementary school learners, the seamless learning cycle has not been adapted for adult learners sufficiently. As the result illustrated, such a seamless learning activity can promote the effectiveness of Chinese lexicon learning for college students at beginner- learner level. Hopefully, this study would also assist Chinese language educators to explore more approaches to synthesize pedagogy teaching with the real-life activities.

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