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Using Concept Mapping Instruction in Mobile Phone to Learning English Vocabulary

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Mobile technologies have enabled various new learning approaches. The researcher investigated the effectiveness of using Short Message Service (SMS) with concept mapping for English as Foreign Language learners' vocabulary learning. The results indicated that after receiving English vocabulary lessons via SMS, the concept mapping group performed significantly better than the random group on the test scores, especially on the translation part.

Keywords: M-learning; SMS; Computer-Assisted Language Learning

Introduction

Most teachers and language learners feel that vocabulary learning is not an easy task, and most learners also have trouble memorizing large amounts of vocabularies and phrases (Schmitt, 2010; Oxford, 1990). An abundance of evidence about the use of mobile devices, such as laptops, PDAs, and mobile phones in education has been reported (e.g., Ally, 2009; Chen, Hwang, Yang, Chen, & Huang, 2009; Chu, Hwang, & Tseng, 2010; Hwang & Tsai, 2010; Hwang, Yang, Tsai, & Yang, 2009; Kukulska-Hulme & Traxler, 2005; Shin, Chuang, & Hwang, 2010; Thornton & Houser, 2002; Vavoula, Sharples, Rudman, Meek, & Lonsdale, 2009). Mobile technologies have been also applied as language learning tools (Cavus & Ibrahim, 2009; Chinery, 2006; Roschelle, Sharples, & Chan, 2005; Thornton & Houser, 2003, 2004, 2005). Among the mobile devices, short message service (SMS) is one of the major capacities of mobile phones (Lu, 2008). Reasons for the high rate of sending SMS messages include its low price and asynchronous nature (Mitchell, Heppel, & Kadirire, 2002).

Consequently, some work has been done to date on using SMS through mobile phones to assist learning (Bollen, Eimler, & Hoppe, 2004; Cavus & Ibrahim, 2009; Chen & Chung, 2008; Lu, 2008; Markett, Arnedillo Sanchez, Weber, & Tangency, 2006; Mitchell & Doherty, 2003; So, 2009; Stone, Briggs, & Smith, 2002). SMS technologies were also proved by many researchers to be effective for language learning (e.g., Cavus & Ibrahim, 2009; Kennedy & Levy, 2008, Levy & Kennedy, 2005; Lu, 2008; So, 2009; Thornton & Houser, 2005), and research on SMS or mobile learning is emerging more regularly in the CALL literature (Stockwell, 2010). The reasons are that discrete SMS messages can be provided in a short manner and readily available for learners, such as in buses or waiting lines. The learning process is not as interrupting as other media like audio or video (So, 2009). Kukulska-Hulme & Shield (2008) also point out another advantage that the mobile devices are ideal for the "push" approach of learning by sending information to the learners at set times and on set days.

In the past decade, various studies concerning applied concept mapping in language learning: four of them focus on English reading (Cassata-Widera, 2008; Huang, 2005; Liu, Chen, & Chang, 2010; Zittle, Johari, & Eastmond, 2005), four of them on Chinese reading (Chang, Sung, & Chen, 2001; Liu, 2001; Ye & Zhan, 2000; Wu & Zeng, 2003), two of them are related to vocabulary learning (Bahr & Danserearu, 2005; Liu, Peng, Zhuo, & Lin, 2007), and the other eight are about writing (Feng, 2004; Giombini, 2004; Giombini, 2008; Hunter, 2008; Lin, 2002; Liu, in press; Straubel, 2006a, Straubel, 2006b). All of the results indicate that using concept maps has more positive effects than traditional teaching.

Mobile technologies not only enable anytime and anywhere learning, but also provide an opportunity to develop and support situated learning. Nevertheless, without proper support, these new learning scenarios might be too complex for students, and the learning achievements could be disappointing (Hwang, Shi, & Chu, 2011; Hwang, Wu, & Ke, 2011). Although concept maps have been recognized as an effective way of assisting students in interpreting and organizing their personal knowledge (Jonassen & Carr, 2000), only two studies proposed concept mapping for supporting mobile learning activities in nature science courses (i.e., Hwang, Shi, & Chu, 2011; Hwang, Wu, & Ke, 2011). The experimental results of these two studies show that the proposed approach not only enhances learning attitudes, but also improves the learning achievements of the students.

Literature Review

The possibility of learning language at any time and at any place is highly desirable for busy learners (So, 2009). Studies investigating using SMS for learning vocabulary have started to

appear in the literature, and the focuses of the research have been varied (i.e., Chen, Hsieh, & Kinshuk, 2008, Cavus & Ibrahim, 2009; Kennedy & Levy, 2008; Levy & Kennedy, 2005; Lu, 2008; Thornton & Houser, 2005). One study has been conducted in classrooms. For example, Chen et al.'s (2008) explored how to better match different instructional strategies (written annotation and pictorial annotation) for presenting English vocabulary learning content with learners' individual verbal or visual ability via SMS. The findings show that providing learning content with pictorial annotation in a mobile language learning environment can help learners with lower verbal ability and higher visual ability to learn better.

In addition to the indoor activities, the rest of the studies have been conducted outside the classroom (i.e., Cavus & Ibrahim, 2009; Kennedy & Levy, 2008; Levy & Kennedy, 2005; Lu, 2008; Thornton & Houser, 2005). These studies were based on the "push" mode of operation, which means teachers control the frequency and the timing of message sent to learners. Cavus and Ibrahim (2009) developed a SMS-based system to test Turkish undergraduate students. Participants were randomly divided into three groups to receive messages, which were composed of English technical words and the definitions in students' mother tongue. Spaced repetitions of the same messages were sent on different days to different groups for nine days. After administering the post-test, the results showed that students learned new words with the help of the mobile phones.

Similarly, Levy and Kennedy (2005) described a project of sending Australian learners Italian language lessons related text notifications through SMS. The project was entitled "Italian Literature and Society". Students were sent new words and example context sentences about what they have learned during class or details of upcoming programs they wanted learners to watch. On an average of nine to ten messages were sent per week. No measures of effectiveness were conducted in Kennedy and Levy's study. Surveys administered in these studies indicated that learners felt that these messages were very helpful for learning vocabulary, although some indicated that the messages were too frequent. Similar reports by the same authors on the topic can be found (Kennedy & Levy, 2008).

To determine effectiveness, Thornton and Houser (2005) compared Japanese university learners who received the e-mail mini lessons against learners who could access the same material through SMS and learners who were given the materials on paper. Five individual lessons were sent three times a day for a two-week period. The lessons include learning a single word, some facet of a word, and examples. The result showed that the learners who received the e-mail or SMS scored better on post-tests compared with the paper group. The survey results also indicated that most students preferred the SMS instruction and had strong belief in it as an effective teaching method.

Lu (2008) explored the application of SMS in second language learning in Taiwan for two weeks. The high-school students were divided into paper group and SMS group. They were received two sorts of 28 English words; one was on paper while the other was through SMS for two weeks. Each of the lessons contained English words, Chinese translations, and syntactic categories. According to the result of the post-test, students of SMS group recognized more English words after reading the vocabulary lessons via SMS than students of paper group. Students reported they read the SMS literally anytime and everywhere-in commuting, between classes, or even before going to bed. The study also stressed that frequent exposure enhanced word recognition and retention.

Meaningful learning requires that the learner engage in substantial cognitive processing during learning, but the learner's capacity for cognitive processing is severely limited. A central challenge facing instruction designers is the potential for cognitive overload—in which the learner's intended cognitive processing exceeds the learner's available cognitive capacity (Mayer & Moreno, 2003; Sweller, 1999; Sweller, 2005). Within cognitivism implications, the technique of using a concept map for organizing and relating the learning concepts can help learners to visualize a certain knowledge structure in a graphic-diagrammatic form. From a cognitive perspective, the concept map has been used as a psychological instrument to structure, guide, and transform knowledge on the basis of psychological traditions (Liu, 2010). Novak (1993) argued that visualization of concepts and relations may be efficient at "chunking" knowledge to increase the storage capability of students' short-term memory.

Some researchers have examined the effectiveness of the concept mapping strategy for assisting word learning (i.e., Bahr & Dansereau, 2005; Liu, Peng, Zhuo, & Lin, 2007; Margosein, Pascarella, & Pflaum, 1982). Although the participants and learning content were different among the three studies, most of the results showed that the concept mapping strategy is effective in word learning (Liu, 2010). Liu et al. (2007) taught fifth grade students with concept mapping and visualized learning, enabling learners to draw representative learner-constructed maps to assist in the comprehension of target vocabulary. It was found that in the process of comprehending words to draw maps successfully, learners had to think about the words' morphology, semantics, phonetics, etc., and thus their memorization of the vocabulary was enhanced

Methodology

The college students from two English classes participated in this study. The researcher divided the participants from these two classes into two groups: the random group and the concept mapping group. The concept mapping group was provided with concept mapping strategy instruction in teaching and four vocabulary concept maps which were to be used in conjunction with the SMS messages that the students received to learn the target vocabulary. As for the random group, the instructor used traditional instruction in class to learn the same target vocabulary.

A concept map is a diagram showing the relationships of vocabularies. It was the strategy used in the study to support learners to organize information through visual aids. In this present study, the target vocabularies consisted of nouns (n), verbs (v), adjectives (adj), and phrasal verbs (phr v). These vocabularies were further categorized into concept map categories. Each concept map was coupled with a diagram and a section that explain the reasons to constitute the certain map.

The random group received the target vocabulary items sent by SMS message once each day during the experiment in random order; that is to say, they received two semantically unrelated words each day. For the concept mapping group, the English vocabulary items were divided into two sections and each section was sent by SMS message for one week. Moreover, the vocabulary was divided into semantically related pair sets and delivered by SMS message twice each day. Each message sent to both groups was composed of two English vocabulary items,

followed by their syntactic categories, Chinese translation, and example sentences.

The purpose of the tests was to evaluate the subjects' vocabulary knowledge after they had read the messages. There was vocabulary comprehension test used in this experiment which was designed by the researcher of this study. Each test was composed of 30 items and divided into three parts: Translation, fill-in-the-blanks, and multiple choices. The total score of each test was 100 points.

Result

In order to analyze the differences between the random group and the concept mapping group on the two comprehension tests. The differences in the delivery strategies between the random and concept mapping groups were not significant. However, there was a significant difference between the random and concept mapping groups regarding the translation part with the concept mapping group performing better than the random group.

Conclusion

Specifically, the results indicate that after receiving English vocabulary lessons integrated with the concept mapping strategy via SMS for two weeks, the concept mapping group performed significantly better than the random group on the translation part of the test. Thus, integrating the concept mapping strategy with SMS can be seen as having a positive effect on English vocabulary learning.

In conclusion, the above discussion suggests that learning English vocabulary with the help of the concept mapping strategy is an effective method for learners. Therefore, when participants have to learn English words with SMS, offering them concept maps can help them learn better.

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