

A Study on the Mobile English Vocabulary Learning System with the Function of Conducting Formative Assessment

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Abstract: The study first focuses on analyzing the features and related functions of mobile learning, and then, moves on to review the learning strategies of English vocabulary to form the theoretical basis for the mobile English vocabulary learning system developed in the study. 103 seventh-graders from 3 intact classes in a junior high school in Taipei City were recruited. The three classes were randomly assigned to three different treatments. Experimental group A learned English vocabulary through the mobile learning system with the function of formative assessment. Experimental group B learned English vocabulary through the same system but without the function of formative assessment. Finally, the control group received traditional classroom-based teaching of the same English vocabulary. The differences of learners' achievements, vocabulary retention, and learning process were compared and analyzed.

Keywords: Mobile learning, English vocabulary learning, formative assessment, context awareness

Introduction

The essence of language learning lies in the buildup of vocabulary competence (McCarthy, 1990); it could be found in contemporary researches that situation-embedded English vocabulary learning is highly emphasized, and that conversational and situational contexts are key to the mastering of lexicon competence. Mobile computers and context-aware services could appropriately adapt the contents of learning, based on personal situation, environmental situation, personal data, and environmental data (Hwan, 2006; Schiller, Adams & Want, 1994), to tap into the needs of learners. Accordingly, there is a need to better integrate technologies of mobile learning and context awareness to aid English vocabulary learning. As for formative assessment, it's been empirically proven to be able to facilitate learning and provide timely corrective feedbacks for learners (Bransford, Brown, and Cocking, 2000).

1. Research Goal

The purpose of the study is to establish a mobile English vocabulary learning system which could assess learners formatively, and to investigate the impacts such system might exert on users' learning achievements and vocabulary retention. Meanwhile, suggestions on current designs and studies regarding formative assessments are given, based on the results of the study.

2. Establishment of the System

The mobile English vocabulary learning system is primarily composed of two services, namely, “context-aware service” and “English vocabulary filtering service,” which could provide learners with situation-based materials and formative assessment. In context-aware service, the “positioning service” could sense learners’ current positions with both GPS and Wifi positioning system (Figure 1). Regional information would be displayed on the device after positioning was accomplished (Figure 2). On the other hand, the “learning process recording service” provided records of learner’s learning process and formed the foundation for context-aware service and formative assessment tools.

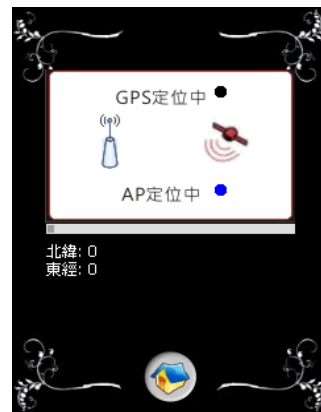


Figure 1 Automatic positioning is being carried out



Figure 2 Automatic distribution of learning materials

English vocabulary filtering service, built upon context-aware service, would “filter” all the English vocabulary learning materials, and then, present appropriate ones to the learners. Learners could access all of the situation-related English vocabulary after entering the learning system; information, such as Chinese translation, phonetic alphabets, pictures, sample sentences, hand-writing practice, and pronunciation were available to them (Figure 3). The flashcard-like display of English vocabulary (Figure 4) could boost learners’ memorization of vocabulary and self-directed learning. Also, the visual aids enabled learners to better associate vocabulary with real objects.



Figure 3 The platform of English vocabulary learning

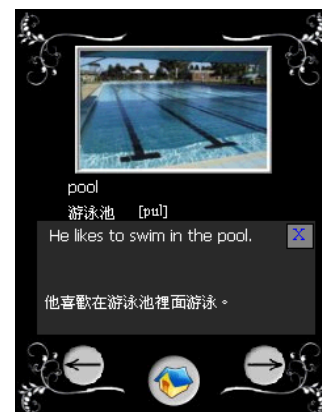


Figure 4 Learning materials filtered by the system

In the formative assessment tools, there were three types of vocabulary tests, including matching test, spelling test, and sentence-making test. Learners could adjust the difficulty of tests by themselves and get more familiar with the learning materials as they got repetitive exposure to the same group of vocabulary. Moreover, the system didn’t offer learners the correct answers immediately after they made a mistake; instead, it showed learners the definitions of the vocabulary, giving learners the chance to figure out the answers on their own. Buchanan (2000) points out that learners’ retention of

learning materials could be fostered by prompting them to figure out confusing concepts on their own.

3. Research Method

The study aimed at comparing the effects of three teaching methods, namely, mobile English vocabulary learning systems with and without the function of conducting formative assessment, and traditional classroom-based teaching, on learners' achievements, vocabulary retention, and learning process. Teaching methods and learning anxiety served as independent variables, while learners' performance on the English vocabulary achievement tests and their learning process serves as dependent variables.

The study adopted a quasi-experimental design, in which control group is not commensurate to experimental groups. The subjects of the study were 103 seventh-graders from three classes in a junior high school in Taipei City; all three classes received instructions from the same teacher. The two experimental groups learned through the mobile English vocabulary learning device, while the control group learned in traditional setting, the classroom. A pre-test and post-test were implemented to measure learners' mastery of the learning materials. And to testify whether learners achieve long-term retention of the materials, the participants were asked to take a delayed post-test ten days after the experiment.

An evaluation questionnaire was administered to gather information about learners' perceptions of the learning materials, learners' willingness to learn, ease of operating the system, learners' reflections and suggestions, and the overall evaluation of the system; another questionnaire regarding English learning anxiety was also presented. Finally, six participants with high, intermediate, and low level of learning anxiety were randomly picked from experimental group A and experimental group B for an in-depth interview. The purpose of the interview was to find out learners' perceptions of mobile learning, such as problems they encountered, benefits in motivation and achievements, strategies they adopted, as well as formative assessment tools.

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