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Seamless Vocabulary Learning in English Course Using Mobile Devices

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Abstract: In this paper, we propose mobile-assisted vocabulary learning and present learning scenarios seeking smooth and seamless transitions between learning in-class and outside-class, incorporating students' self-learning into classroom activities, which is expected to result in effective vocabulary learning. Two experiments using mobile devices are proposed to find out some answers to the following questions: (1) Does the use of mobile devices support seamless English vocabulary learning? (2) Can the additional adaptive contents recommended by the system help vocabulary learning?

Keywords: Seamless Learning, MALL (Mobile Assisted Language Learning), Vocabulary Learning, EFL

Introduction

English has become the lingua franca of the world due to globalization and internationalization in recent decades [1]. Therefore ESL (English as a Second Language) education is inevitable for non-English speaking countries including Japan. It has been pointed out that Japanese learners of English are in lack of vocabulary though it is an essential component in language learning, and it is evident that with more unknown words, more difficulty the learners face in understanding English [2]. Therefore it is very important to build up vocabulary to improve one's language skill. But at the same time vocabulary teaching/learning methods are considered boring [3]. Then the following question occurs: 1) What if technology can support effective/enjoyable vocabulary learning for ESL learners? If such a system were successfully implemented, its contribution to vocabulary learning or furthermore, language education in general, would be immeasurable.

1. Theoretical Background

1.1 Seamless Learning

Recent progress of mobile and wireless technologies offers us the potential for a new learning environment, namely "seamless learning". It has been gaining quite a few researchers' attention as a new learning environment [4] [5] [6] [7]. "Seamless learning" means to describe the situations where students can learn whenever they want to in a variety of scenarios and that they can switch from one scenario to another easily and quickly using one device or more per student ("one-to-one") as a mediator [4]. In this paper, by seamless learning, we mean learning which occurs with seamless transitions between in-class and outside-class learning, between handheld use outside-class and desktop use inside-class. Seamless learning can be depicted in a two-dimensional way 1) in-class and outside-class learning and 2) planned and unplanned learning [5]. And if the technology could help these

four types of learning interact each other and help them incorporated into one continuous learning beyond time and space, learning would be very successful (Figure 1).

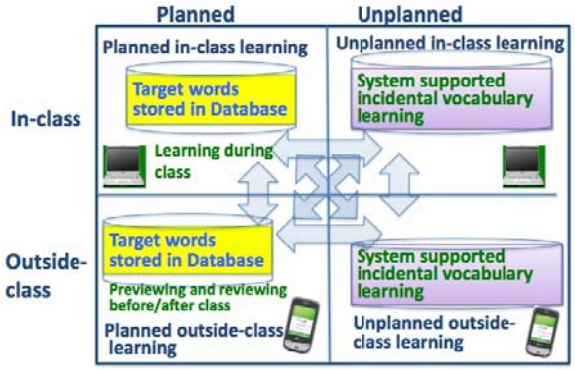

Figure 1. Incorporation of Four Types of Vocabulary Learning with the Help of Technology (adapted from So et al, 2008 [5])

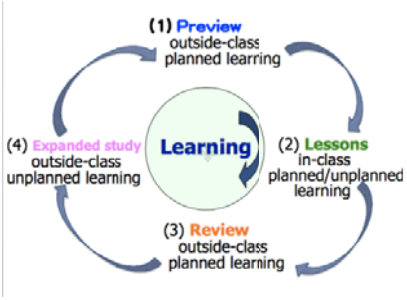

Figure 2. Cyclic Model of Learning (adapted from Takeuchi, 2007)

1.2 Cyclic Model of Learning

One premise of our seamless learning idea is that there are four processes of class learning: 1) previewing, 2) in-class lesson, 3) reviewing, and 4) expanded study. Good class should be conducted in the way that all these processes run smoothly and seamlessly. This concept is depicted by the term, 'cyclic model of learning', which was proposed by Takeuchi (2007) [8] (Figure 2), where 'class', in a broad sense, means not only learning in-class but also learning outside-class and it allows teachers to incorporate students' self-learning into classroom activities [9]. Seamless learning and cyclic model of learning, these two concepts share the same idea that learning can occur wherever they are, and that every learning experience both in-class and outside-class interacts each other. This concept is critical for English education in Japan since it has been pointed out that learning time of English at school is not sufficient [8]. If in-class learning time is limited, there is no other way but to learn out-side class.

2. System Design

Based upon the above ideas, we design the following Seamless Mobile-Assisted Language Learning Support System (hereafter we call it SMALL System) (Figure 3). In our system, (1), (3), in Figure 2 are mobile-based outside-class planned learning, (2) is a PC-based in-class planned/unplanned learning and (4) is a mobile-based outside-class unplanned learning.

Word Data in Figure 3 consists of target words chosen by the teacher from the textbook. Data is imported to the system from an electric or OCR scanned textbook. **Quiz Logs** consist of all the quiz results the students, which are analyzed and evaluated. This newly gained data reflect review quizzes and difficulty level adjustment and facilitate their learning processes. **Learner Info** contains the students' English levels and their fields of interests for the distribution of the customized contents. **Related Contents** are obtained through RSS feed and delivered to the students' mobile devices according to their English levels and their interests for the expanded study. **Learning Log System** supports the students to register their newly acquired words and the system give them quizzes from new words.

The scenarios based on Figure 2 are as follows. Students will be beforehand given vocabulary tests and questionnaires to grasp their English levels and the fields of their interests. They are assigned to write about their current interests on the designated website

on a regular basis so that the system can grasp them which reflect the contents to be delivered for extended study.

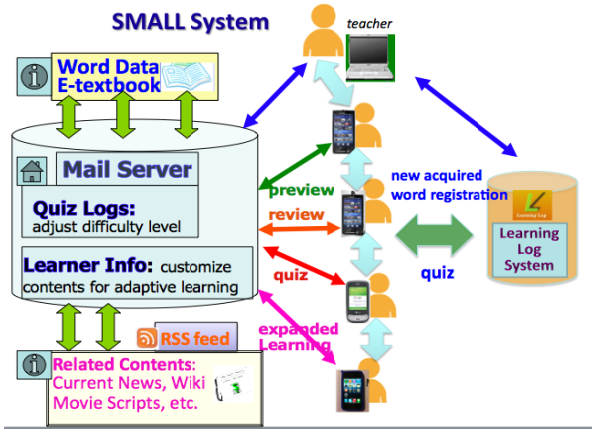

Figure 3. SMALL System

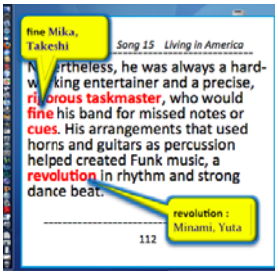

Figure 4. Textbook with Hyperlinks

(1) **Preview (mobile-based outside-class planned learning):** Students receive messages which show the URLs to read the text for previewing and take target word quizzes. Students can choose either web-based texts and quizzes or mail-based texts and quizzes. They answer multiple-choice quizzes until they make correct answers. They can read texts and answer quizzes at any time and at any location using mobile devices, whether it is a smart phones or a conventional type. (2) **Lessons (PC-based in-class planned/unplanned learning)** :In the electronic/scanned textbook, target words are hyperlinked and when the teacher clicks them, new windows will be opened and they show names of the students who made wrong answers so he can pay attention to them during class (Figure 4). They are given web-based quizzes to make sure if they learn the target words during the lesson. (3) **Review (mobile-based outside-class planned learning)**: Students receive messages which show the URLs to read the text for reviewing and take target word quizzes. The system reports the test results with most frequently mistaken word ranking lists and the teacher will review these words in the next class. So the learning occurs continuously. (4) **Expanded Study (mobile-based outside-class unplanned learning)**: SMALL System recommends the contents of each student's interests which include target words learned in class. The target words are highlighted in the expanded study texts. The students register new words they learn through the expanded study and if the registered words are among target words to be learned or already learned in the textbook, then the system let them know it. That way their expanded outside-class unplanned learning will be linked to in-class planned learning. The system give them quizzes from the newly acquired words through outside-class unplanned learning to support gaining new vocabulary. The System shows each student his degree of advancement by counting his correct answers out of total number of target words. They are provided with quizzes of the words they already have answered correctly after a certain interval to make sure if they are retaining their newly acquired vocabulary. That way it is expected that their short-term memory will be transferred into long-term memory. During expanded study, if some students have read the same contents or register the same word, the system will let them know. It will possibly trigger peer-to-peer (P2P) discussion and let them interact each other in the knowledge-aware virtual learning community, which will lead P2P collaboration. In addition, each student is supposed to present in-class in turn what he/she has learned through his/her expanded study so that the teacher can incorporate

students' unplanned self-learning into classroom activities. Students are encouraged to collaborate other students who have the same interests during presentation task.

3. Methods

3.1 Experiment 1

A hundred university students will be divided into two groups. Each group of students engage with the two conditions with and without SMALL System in turn (Phase 1 and 2) over six weeks. Pre- and post-tests will be conducted, and their test results and all the students' learning logs will be analyzed to see if there is any significant difference between the two conditions. The questionnaires will be used to assess advantages and disadvantage of SMALL System.

3.2 Experiment 2

The purpose of this experiment is to verify the validity of adaptive Expanded Study of SMALL System. 100 university students will be divided into two groups (Group A with adaptive Expanded Study & B with Expanded Study without adaptation) to see if there will be any significant difference in vocabulary learning. Questionnaires and learning logs will be analyzed to assess its availability.

4. Early Insight

Possible advantages of SMALL System are: 1) Learners are provided with anytime-anywhere-based learning environment 2) Its implementation is easy. 3) In-class and outside-class learning are closely related so that learners can learn under the guidance of their teachers. 4) It compensates the lack of learning time in class. 5) Automatic message/contents delivery helps reduce teachers' heavy workload. 6) Customized contents help students enhance their motivation to learn more.

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