

Online Multilingual Vocabulary System and its Application in L2 Learning

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ABSTRACT

In the field of second language teaching, vocabulary has been one of the most neglected areas in the classroom. Although language teachers/ instructors are well aware of the importance of vocabulary, there is not enough time in the classroom to actually “teach” vocabulary. Therefore, we need to find ways to promote autonomous vocabulary learning so that students can make good use of their time outside the classrooms.

In this study, we present an online vocabulary learning system that we have developed. The results obtained from our evaluation experiment indicate that our system is more effective in retaining the meaning of the words compared to the traditional learning method.

As an example of applying this system to language learning, we will give a demonstration of a Japanese onomatopoeia dictionary that we are compiling. Onomatopoeia are especially troublesome for learners of the Japanese language. Although they are frequently used in both written and spoken Japanese, they are very difficult to translate to other languages. We demonstrate that by employing our system, learners are better able to understand the meaning and the context of each lexical item.

Keywords: Autonomous Learning, Mobile Devices, Multilingual, Online Vocabulary System, Onomatopoeia, Ubiquitous Learning

INTRODUCTION

According to a survey of nearly 1000 Japanese university students, vocabulary teaching is considered to be one of the most neglected aspects in language teaching (JACET Kansai, 1995). One of the reasons why it has been neglected in the classroom is because unlike grammar, vocabulary is largely a question of accumulating individual items. This means that teachers expect students to “study on their own”, since there is not enough time in the classroom to actually “teach” vocabulary. This trend is probably universal. Therefore, we need to find ways to promote autonomous vocabulary learning so that students can make good use of their time outside the classrooms.

Recently, e-Learning based on mobile devices is getting more and more popular as a way of learning a foreign language. Particularly, in the case of vocabulary learning, the more time spent on learning, the better the result (Amemiya, Hasegawa, Kaneko, Miyakoda, & Tsukahara, 2007). In this sense, employing mobile devices in vocabulary learning is an ideal way of studying because the mobility and portability of these devices provide the users with a ubiquitous environment, where they can study whenever and wherever they like.

In this study, we report on the online vocabulary system that we have developed. Our system consists mainly of three subsystems; “HodgePodge”, “MultiPod” and “PodBase”. Our emphasis in developing the system was to enhance the use of mobile devices such as iPods in language learning so that users can make good use of their time. The results obtained from the evaluation experiment imply that our system has a better learning effect compared to the traditional learning method.

The paper is structured as follows. First we give an outline of our vocabulary system, then report on the results from our evaluation experiment. After that, we take up the issue of the content of the learning materials that are employed in our system, together with a brief account of our onomatopoeia dictionary that we are starting to compile. The final section concludes the study.

OUTLINE OF THE SYSTEM

The online vocabulary learning system framework that we have developed is depicted in Figure 1.

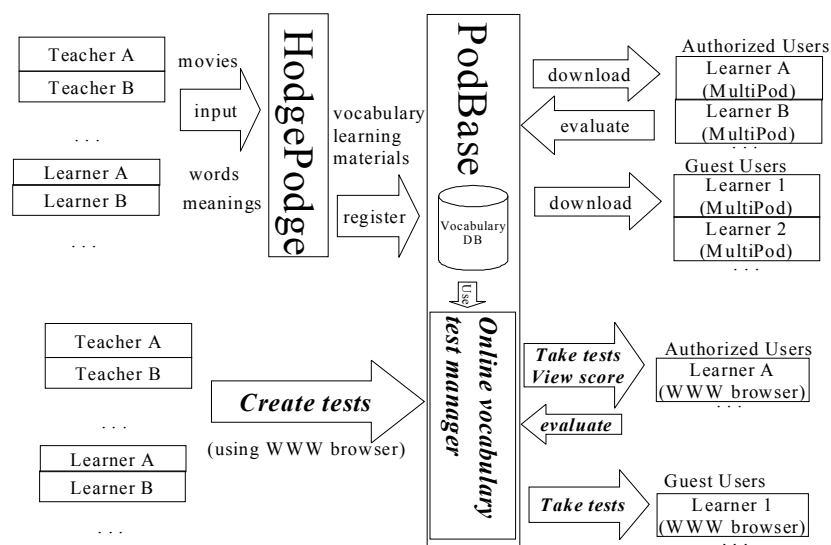


Figure 1 Outline of online vocabulary system

Our system is composed of three major subsystems: “HodgePodge”, the system for creating the learning materials; “MultiPod”, the system that enables the users to download the learning materials from the database to their computers or portable devices; and the material managing system “PodBase”. In addition, PodBase is

comprised of an online vocabulary test manager that users can operate via the WWW browser in order to either create or take tests. This function, however, has no direct relevance to our discussion that follows and will not be taken up in detail.

The basic flow of operation is as follows. First, the teacher/ instructor (or the learner) creates the learning materials with the aid of HodgePodge. The materials are then stored within the contents database, the PodBase. When the users want to use these materials for learning, they select the materials that they need from PodBase, then transfer them onto their computers with MultiPod. The MultiPod system automatically creates a personal folder containing the selected materials. Data transfer can be done by dragging and dropping the personal folder onto the iTunes window (an application for transferring data to iPods).

In the following sections, we present details of the main functions of the system components.

HodgePodge

“HodgePodge”, as previously mentioned, supports its users in creating the learning materials. The content for each material consists of the text data together with the sound and visual data. We decided to include these three types of data in each material because the results obtained from our experiment indicated that the most effective method in learning vocabulary is to combine these three types of data together. For details, please refer to Hasegawa et al., 2006.

When HodgePodge is fed a five-second movie clip and the text data comprised of the spelling and the meaning of the word to be learned, it automatically creates a multimedia word learning material. The process of creating materials is summarized in Figure 2 (Hasegawa, Amemiya, Ishikawa, Kaneko, Miyakoda, & Tsukahara, 2007a):

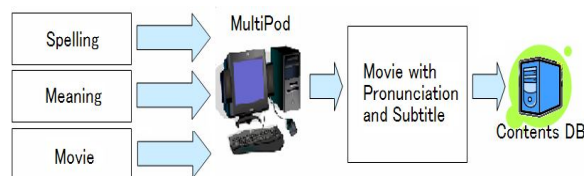
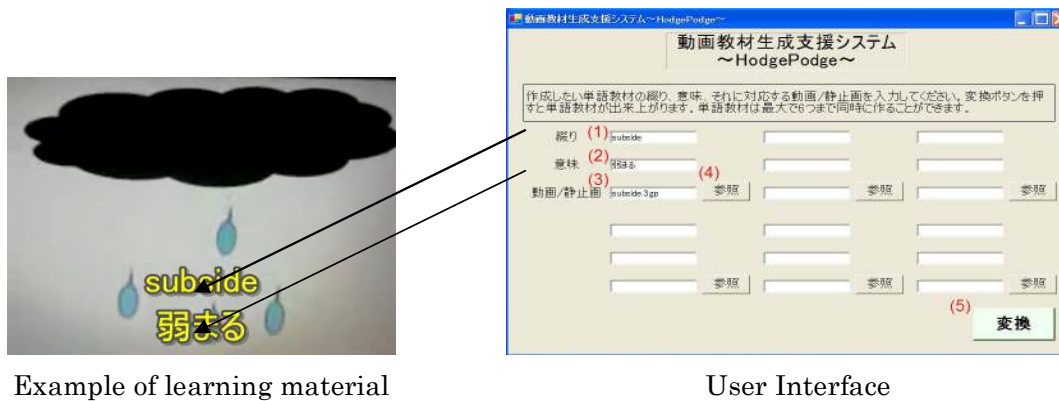


Figure 2 The outline of creating materials

In Figure 3, the user interface of HodgePodge is given (Hasegawa, Ishikawa, Amemiya, Kaneko, Miyakoda, & Tsukahara, 2007b):



Example of learning material

User Interface

Figure 3 User interface and example of a learning material

Let us go over the process of creating a learning material by focusing on the operating procedures of this interface. Here, we take an English-Japanese material as example. First, the teacher or the instructor inputs the spelling of the word in (1) and the corresponding Japanese meaning in (2). Then, using (4), the file path for the visual data is searched, and the movie or still image file is uploaded onto (3). Up to six lexical items can be generated at once. After filling in all the needed information, the conversion button (5) is clicked and the system automatically generates the learning material that has the spelling (“subside”) and the meaning of the word (“弱まる”) incorporated into the corresponding movie or still image.

PodBase

PodBase is a web application which manages learning material storage, distribution of these materials and their evaluation for both authorized users and guest users. The authorized users have full access to all the available functions on our online system. On the other hand, guest users are those who are temporarily using our system on trial, i.e., the non-authorized users. They have limited access to the online system.

PodBase

Hello! ishikawa !

Word List ALL

| Word | Meaning | Grading | Count | Date | Download | Comment |
|------------|------------|---------|-------|---------------------|----------|---------|
| wrinkle | しわ | 0 | 3 | 2007-02-16 17:21:14 | DL | Comment |
| utensil | 家庭用品 | 0 | 1 | 2007-02-16 17:20:29 | DL | Comment |
| stumble | つまずく | 0 | 0 | 2007-02-16 17:19:39 | DL | Comment |
| stir | かき混ぜる | 0 | 0 | 2007-02-16 17:11:51 | DL | Comment |
| sticky | べとべとする | 0 | 0 | 2007-02-16 17:10:50 | DL | Comment |
| stationery | 文房具 | 0 | 0 | 2007-02-16 17:10:11 | DL | Comment |
| staple | ホチキスで留める | 0 | 0 | 2007-02-16 17:09:15 | DL | Comment |
| stain | 汚す | 0 | 0 | 2007-02-16 17:08:22 | DL | Comment |
| sneak | こっそり出入りする | 0 | 0 | 2007-02-16 17:07:38 | DL | Comment |
| sip | すする、ちびちび飲む | 0 | 0 | 2007-02-16 17:06:42 | DL | Comment |
| scrub | こしこし洗う | 0 | 0 | 2007-02-16 17:05:40 | DL | Comment |

Figure 4 Example of a wordlist in PodBase

When an authorized user creates a learning material, he/she can upload and store it in PodBase so that it can be shared among the users. Once a material is uploaded onto PodBase, other users have free access to its use, and furthermore, they can also give evaluations. Evaluation results for each material are given as points between -3 to +3, and comments can also be added. Moreover, since PodBase records the number of downloading for each material, the popularity for each one can be estimated by the download count. When users want to transfer the data to their computers or mobile devices, they can either refer to the spelling or the meaning, or, may select according to their popularity, which is reflected in the grading and download count (Figure 4).

The materials downloaded from PodBase can be displayed on mobile devices such as iPods with the help of MultiPod, whose details will be given in the following section.

MultiPod

The main characteristic of MultiPod is that it enables the users to transfer data from the Database to their computers or portable devices such as iPods . The portability of iPods allows learners to make good use of their free time, and will enhance the

opportunity of self-education. Moreover, the shuffling function of iPods can be put to good use.

MultiPod manages the downloaded materials and also records the learning logs so that users can easily check their learning process record (cf. Figure 5).

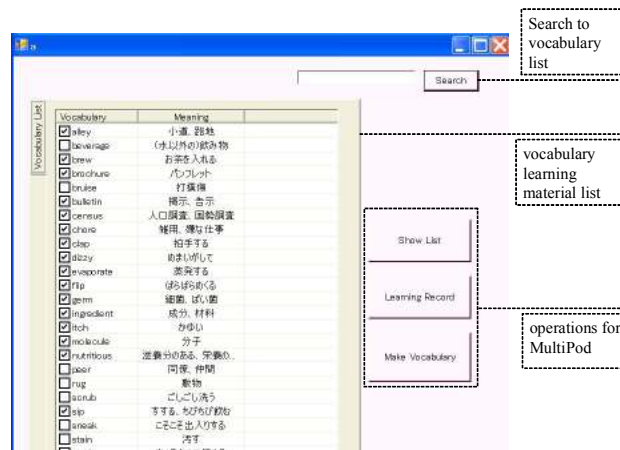


Figure 5 Vocabulary list from MultiPod

MultiPod is also equipped with a function that records the pronunciation data used to make the materials. Recording starts by clicking the 'Rec' button, and automatically ends after two seconds. The users can record the pronunciation by using external sound devices connected to their personal computers. When the recording has finished, the upper indicator changes its color from green to red (cf. Figure 6):



Figure 6 Recording screen of MultiPod

Although the learning materials for iPods can be downloaded through “MultiPod” and “iTunes”, at present, the test manager is not available. However, recently many mobile devices such as smart phones, PDAs, etc. can connect to the Internet through wireless networks. In near future, we plan to make use of these devices so that test management on mobile environment can be made available.

In the next section, we provide information concerning the evaluation experiment for our system.

EXPERIMENT

10 university students participated in our evaluation experiment. The subjects were then divided into two groups, A and B. The subjects in Group A were all instructed to memorize the meaning of 10 English words employing the online vocabulary system for the first 10 minutes, then, they employed the pen-and-paper method to learn the remaining 10 words for the next 10 minutes. The subjects in Group B were instructed to learn in the exact opposite order: i.e. they first learned by the traditional Pen-and-Paper method, then, switched to the online vocabulary system. The experiment was thus designed in order to eliminate any effects of sequential ordering. Three tests were then carried out in order to observe the memory retention rate of each method; the first directly after the memorizing process, the second two weeks after the experiment, the third two months after. The average scores of the tests are summarized in Table 1:

Table 1 Average scores of evaluation tests

| Method | Test 1 | Test 2 | Test 3 |
|---------------|------------|-----------------|------------------|
| | Just After | After two weeks | After two months |
| Online system | 9.6 | 4.0 | 3.1 |
| Paper-and-pen | 9.3 | 2.7 | 1.7 |

The full mark is ten points. For the scores shown in Table 1, we conducted a t-test with a 5% significance level. The difference between the scores for Test 3, which was conducted two months after the first experiment, proved to be significant with a 95% coefficient. This result implies the effectiveness of employing the online vocabulary system in learning the meaning of foreign words compared to the traditional method.

THE LEARNING MATERIALS

In this section, we report on the learning materials that are used in the online vocabulary system.

Multilingual materials made instantly

One of the advantages of creating materials with our system is that the same material can be reused or recycled so that it can be applied to virtually any language or dialect. For example in Figure 7, the left material was originally created for Japanese learners of English. The English word appears on the first line and the corresponding meaning in Japanese appears on the second. If we change the typed-in information from Japanese to Chinese, then the system automatically transforms the material into an English-Chinese material (the material shown on right).

Our system allows the teachers/ instructors to easily create the learning materials for their students to study. Alternatively, students themselves can be encouraged to actively take part in making the learning materials themselves. One of the features of MultiPod is that it greatly facilitates the creating of multilingual learning materials. As we have just mentioned, the learning material for a certain language can instantly be made into a material for a completely different language just by changing the information included in the subtitle. By employing a universal image common to all languages, users can easily create multilingual vocabulary materials such as Japanese word learning materials for Chinese speakers, French word learning materials for German speakers, and so on.



Figure 7 English-Japanese material (left), English-Chinese material (right)

Onomatopoeia dictionary

We have already compiled a fairly good amount of English-Japanese common words, and at present, we are starting to work on a multilingual onomatopoeia dictionary system. This section draws heavily on Matsumoto (2008).

Onomatopoeic expressions refer to words that contain sounds that are similar to the noises they describe. In English, words such as “wham”, “hiss” or “thud” are common examples of onomatopoeia. Although onomatopoeia in English are fairly straightforward and easy to understand, they are not as easy to comprehend in Japanese. This causes a problem for learners of the Japanese language because Japanese has nearly four times as many onomatopoeic expressions compared to English (i.e. 350 vs 1200, Yamaguchi 2002: 13), and are commonly used in both written and spoken Japanese. Because of the wide variety of expressions, it is quite difficult for learners of Japanese to master the meaning of these onomatopoeic expressions.

Since onomatopoeic expressions, as already mentioned above, refer to words that contain the noises they describe, we decided that our system would facilitate the learning of these types of words because our system employs materials consisting of both visual and sound data. By employing not only text and visual information but also the actual noise as sound data, the learners can easily relate the sound with the onomatopoeic expression.

In order to collect the most frequently employed onomatopoeic expressions in actual use, we focused on “manga”, i.e. comic books that are not only popular in Japan, but also in other countries as well. A survey of the 19 most popular manga books resulted in 1761 different varieties of onomatopoeia appearing 4215 times, or, on average, 143 different types of onomatopoeic expressions used 222 times in each book.

In Figure 8, we give an example of a learning material for onomatopoeic expressions. As with the other materials, the Japanese onomatopoeia to be learnt is indicated in the first line, and the corresponding English meaning in the second. A picture of a doorbell is used as visual data, and the actual bell ring is used as sound data.



Figure 8 Example of onomatopoeic material

When this material was shown to three exchange students from abroad who are studying in Japan, they responded that although using both visual and sound data made it much easier for them to understand the meaning, they felt the further need to include information regarding the context in which the expression appears or is used. Therefore, we made revisions to the screen design so that detailed explanations could be added on to the material. In Figure 9, we give an example of the revised material:



Figure 9 Example of onomatopoeic material (revised)

By adding on the explanation area to the screen, it is now possible to explain the meaning in detail, give examples of the context where the expression appears, or compare and contrast similar expressions and to point out the minute differences that may be observed. Although we have received favorable feedback concerning the

revised materials, we have yet to conduct an objective evaluation test to see whether employing these materials really does lead to better learning effects. This we leave for future research.

CONCLUSION

In this study, we have reported on the online vocabulary system that we have designed. One of the characteristics of this system is that it utilizes mobile devices such as iPods to learn the vocabulary of foreign languages.

The result of our evaluation experiment proved that our system is effective in retaining the meaning of the foreign words compared to the traditional pen-and-paper method. Furthermore, since the learning materials for the system is comprised of not only text data but visual and aural data as well, it provides an ideal way to learn onomatopoeic expressions.

In the future, we are planning to create and store the learning materials in a Web-based database and distribute them through the network to support vocabulary learning for Web learners around the world.

ACKNOWLEDGEMENTS

This study is partly supported by Ministry of Education, Culture, Sports, Science and Technology (MEXT) Fund for Promoting Research on Symbiotic Information Technology. It is also partly supported by the MEXT Special Coordination Funds for Promoting Science and Technology.

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