

Cooperative Picture Card Dictionary Authoring System For Communicative Language Learning

Masahiro Yachi

Benesse Educational Research and Development Center

yachi@mail.benesse.co.jp

Abstract

This research proposes a picture card dictionary authoring system to support young language learners perform communicative tasks using daily-life words, without teaching them the vocabulary directly. The system uses a flashcard metaphor, and it provides 3 functions; 1) a teacher creates picture cards by putting the spellings of photos or video taken by learners, 2) stores those cards to the network server as a picture dictionary, and 3) provides an interface to utilize the vocabulary list. These cards will be displayed on an interactive whiteboard, and learners can touch them to hear their pronunciation generated by text-to-speech synthesis, for vocabulary support.

1. Background

When teaching foreign language to young learners, it is necessary to prepare daily-life words for both successful and motivate learning for learners [1]. However, there are often gaps between the vocabulary chosen by teachers and students' interests. This problem occurs because the textbooks only include the general words in formal style language, while the learners' interests stay in their casual communication situation under influence of their popular culture [7]. Although the vocabulary list collected from picture dictionaries was proposed as a solution [1,2], there are still lack of vocabulary based on their interests in their daily life.

2. Analysis of learners' interests

To analyze what actually the learners are interested in, we focused on video taken by 4 elementary school students (age: 9-11), as one of the effective ways to collect their interests [4]. This video archives 45 minute learners' world from their viewpoint [5].

We used *Partage*, a system to watch streaming video actively [8], to list up the scene which includes learners' interests, by creating thumbnails and put annotations on each target scene. Scene detection was done by following rules; 1) when a camera was zoomed

in, 2) when the image paused for more than 1 second, or 3) when the students speak out while steered to the object.

Throughout the video, 101 words were selected and 70 of them were matched to the word listed from the picture dictionary [2], as a basic vocabulary (e.g., ball, cat, tree, etc.). However, the rest of items was not included in the as the basic vocabulary for the following reasons; 1) cultural differences (e.g., cherry blossoms), 2) words from characters, games or sports which are popular among the community, or 3) target age differences (e.g., liquor shop in the street). These words should also be taken into consideration as a part of the vocabulary to express their daily life.

3. System design and implementation

According to the video analysis, we have found that learners' viewpoint is important to build their daily-life vocabulary. In addition, those vocabularies may vary by locality and diverse on each community. To support collecting the vocabulary list continuously and utilize them effectively, we propose a picture card authoring system to create them cooperatively in class.

The system helps interaction between teachers and learners to gather learners' interests, using technologies they are already used to. As shown in figure 1, learners use mobile phones as their devices to capture their interests directly, teacher a PC with keyboards to type the spellings of the pictures, and a card interface to utilize the vocabulary list for communication.

3.1. A flashcard metaphor

To build an interface of this system, we adopt a flashcard metaphor for the following reasons.

Firstly, flashcards are often used and are familiar by both teachers and learners in language education, to show a word corresponding to its picture [6].

Secondly, to connect both students' and teacher's information effectively, we focused on a function of flashcard, which holds information in both obverse side and reverse side. Usually the obverse side has what the learner can see directly, and the reverse side holds

information that requires flipping the card to see. By using this function effectively, we show pictures collected by the learners on the obverse side, and their spellings to generate pronunciation with text-to-speech synthesis on the reverse side.

And finally, as the vocabulary support is used while the communication between two or more persons, the interface for learners is designed for a large screen such as an interactive whiteboard. An interactive whiteboard offers a touch screen pointing device to operate the displayed screen, and as it is difficult to control GUI object compared to a mouse on a usual PCs, we only use touch (click) and drag actions to use the cards [3].

3.2. Implementation

The system runs on Linux with Apache2 and PHP5 to provide both teacher's and students' application interfaces, MySQL5 to store card data, and Postfix and Dovecot to receive images from mobile phones. Learners can operate the interface on Internet Explorer 6, Microsoft Agent and Text-to-speech engines, which are connected using JavaScript.

4. Usage of the system

4.1. Interface for creating picture cards

First, the learners use camera on mobile phones to capture their interests and send them to the server as an e-mail. The attached image files will be stored as obverse side of the card. The images on the card could be either photo data for noun words or video data for verb words. Every card will be converted into either JPEG or Animated GIF format files.

When a teacher's access to the server and receives the image from the mobile phones, s/he can complete the card by putting its spelling for the reverse side, and store to the server database. The system also supports direct audio recording instead of using text-to-speech synthesis to store its pronunciation.

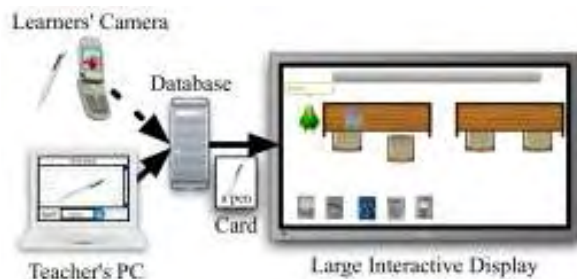


Figure 1. System overview

4.2. Use the cards on an interactive whiteboard

The registered cards will be displayed on an interactive whiteboard. Learners can touch (click) the cards to hear the text-to-speech synthesis generated pronunciation of their images. In addition, they can drag the card to other objects to listen to the usage of preposition in between (e.g. "a watch on a desk.").

4.3. As a tool for teaching support

Although the system uses a traditional flashcard interface, it can track every operations as the system all run on a computer. Every learner's operation logs are saved with their conversation recordings in front of the screen, for supporting teachers to assess learners.

5. Conclusion and future work

This paper points out the importance of collecting the daily-life vocabulary directly from the learners' perspective, and proposed a system for building the vocabulary lists continuously. For the future work, syllabus design for utilizing the system in classrooms could be the major consideration.

6. References

- [1] K. Chujo and C. Nishigaki, "Creating E-Learning Material to Teach Essential Vocabulary for Young EFL Learners," In *Proc. of An Interactive Workshop on Language e-Learning*, 2004, pp.35-44.
- [2] K. Chujo, C. Nishigaki, M. Utiyama, T. Nakamura and A. Yamazaki, "The Vocabulary of Selected English Picture Dictionaries," *Nihon Daigaku Seisankogakubu kenkyu hokoku. B, Bunkei*, vol.38, 2005, pp.77-105.
- [3] K. Dempski and B. Harvey, "Supporting Collaborative Touch Interaction with High Resolution Wall Displays," In *Proc. of 2nd Workshop on Multi-User and Ubiquitous User Interfaces (MU3I)*, vol.9, 2005.
- [4] G. Forman, "Instant Video Revisiting: The Video Camera as a "Tool of the Mind" for Young Children," *Early Childhood Research & Practice*, vol.1, 1999, pp.1-8.
- [5] J. V. Scoter, "Using Digital Images to Engage Young Learners," *Learning & Leading with Technology*, vol.31, 2004, pp.34-37.
- [6] H. Stutz, "Flashcards: Fast and Fun," *Hispania*, vol. 75, 1992, pp.1323-1325.
- [7] N.Y. Suzuki, *Exploring D.F. Benson's Neurology of Thinking: A Search for the Neurological Foundation of Communication and Language*, Keio University Press, Tokyo, 2007.
- [8] M. Yachi and J. Murai, "An active viewing system to utilize streaming video for education," In *Proc. of the 2007 International Symposium on Applications and the Internet*, 2007, pp.38-41.