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Improvement of Situational Dialog Function and Development of Learning Materials for a Japanese Dictogloss Environment

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Abstract: Dictogloss is a learning activity in which learners can cooperatively learn four language skills. We have constructed a dictogloss environment that is able to self-study for learners who study second language. As a previous system, we focus two problems. The first problem is that dialog function to communicate reasons why focused word is wrong is inadequate. The second one is that there are not adequate learning materials for language forms that include communication for reasons. In this paper, we report the solutions for two problems.

Keywords: Dictogloss, Japanese education, corroborative learner agent, self-study

1. Introduction

Dictogloss is a learning method in which learners can cooperatively learn four language skills; listing, speaking, reading and writing (Wajnryb, 1990). In dictogloss, learners learn the target language by the three stages: (S1) dictation stage, (S2) reconstruction stage and (S3) analysis and judgement stage. In S1, the teacher reads short sentences including the focused language forms. In S2, learners take notes about heard sentences and reproduces sentences that have same meaning of original sentences by consulting with collaborative learners. Finally, In S3, the teacher performs answer matching and explains the error of reconstruction sentences. Many studies focus on the effect using dictogloss activity for learning each language skill (Jibir-Daura, R., 2013, Sari Dewi, R., 2014, Lindstromberg, S., et. al., 2016). There is also research on a dictogloss learning system. However, the activity of dictogloss is not suitable for self-study because collaborative learners and teachers are necessary. Therefore, we have constructed a dictogloss environment that is able to self-study for learners who study second language (Kondo, M., et. al., 2012, Tashiro, A., et. al., 2013, Kogure, S., et. al., 2015, Kogure, S., et. al., 2016). In the dictogloss environment, we realize a cooperative learner agent (CLA) and teacher agent (TcA) on the system. In the system, the learner inputs the reproduction sentences using the keyboard. The system does not cover the speaking skill. The learner compares two reproduced sentences written by CLA and themselves. If the learner determines the reproduced sentence is wrong, the learner clicks on the word that they click on the wrong word in the reproduced sentences written by CLA. Then, the system automatically generates a message to CLA for pointing out mistakes (Kondo, M., et. al., 2012, Tashiro, A., et. al., 2013). Learners can also give the CLA a reason why the word is wrong (Kogure, S., et. al., 2015).

As an examination of our dictogloss system, we focus two problems as follows:

(Problem 1) Dialog function to communicate reasons why focused word is wrong is inadequate

(Problem 2) There is not adequate learning material for language forms (LF) that include communication for reasons.

The purpose of this study is to solve these two problems. For archiving these solutions, we construct adequate dialog function to communicate reasons (*Solution 1*) and prepare some enough learning materials *(Solution 2*).

2. Improvement of Dialog Function for Reason

A teacher could only use causality order and causality paradox as conjunctional LF in our previous environment. We extended the conjunction LF so that the teacher can deal with five relationships: conjunction reason, conjunction time, conjunction condition, conjunction paradox and conjunction purpose. We decided these six conjunction relations regarding 3A Corporation Ed. (1998) and 3A Corporation Ed. (2000). We eliminated various knowledge on the reason function of the existing system from program and improved the system so that a teacher gives the system the XML format files that include the information for the reason function.

We take Japanese *Yari-morai* expression as situation reason. *Yari-morai* expression is a combination of *Yari* ("give" in English) and *Morai* ("receive" in English), which is not in English. *Yari* and *Morai* have the role of auxiliary verb. This auxiliary verb adds a weak gratitude exchanges to the main verb. Japanese *Yari-morai* expression has three types: "*shite-ageru*" (T1), "*shite-kureta*" (T2) and "*shite-morau*" (T3). Table 1 summarize types of *Yari-morai* expression. For example, a T2 sentence "*Watashi ha anata ni suugaku wo oshiete kureta*" (I taught mathematics to you) is ungrammatically in Japanese. It is very difficult for beginner to understand Japanese *Yari-morai* expression. English expression cannot distinguish T1 and T2. T1 is used when the actor is themselves or a person close to themselves. T2 is used when the target person is themselves or a person close to themselves. T1 and T2 are in the active and T3 is in the passive. When generating errors for the above three types, the CLA selects one of different type expression. In case using generation rule, the system generates either grammatical sentences or ungrammatical sentences. The teacher gives the system in advance the knowledge of whether it is grammatically correct or not (3A Corporation Ed. (1998) and 3A Corporation Ed. (2000)).

Table 1: Types of *Yari-morai* expression for sample situation.

	Active or Passive	Subject in sentence	Object in sentence
T1: shite ageru	Active	Person for agent	Person for target NG: me or family
T2: shite-kureru	Active	Person for agent NG: I	Person for target
T3: shite-morau	Passive	Person for object	Person for agent

T1 or T2: An agent person give anything to a target person.
T3: A target person is given anything by an agent person.

3. Expansion of Learning Materials

We construct the system to be able to indicate the error patterns by external data file to realize generic learning material configuration. Then, we created 19 learning materials dealing with contextual reason and 3 materials dealing with situational reason. We prepared 3 or 4 sentences for each of 22 materials. We think that materials are enough to understand the basis of Japanese for beginner according to refer to 3A Corporation Ed. (1998) 3A Corporation Ed. (2000). We also prepared 2, 3 or 4 mistakes for each focused LF regarding Ichikawa, Y. Ed. (2010). One of the authors uttered and recorded the content speech of the lesson sentence. We prepared a situation diagram according to search suitable images from free web site. We assume 3 minutes to listen the lesson sentences, 6 minutes to talk to CLA and 6 minutes to the feedback phase. Therefore, we estimated the time it takes to learn one learning material to be approximately 15 minutes. We prepared about 330 minutes learning contents for all 22 materials. Learners can learn about 5 hours and a half in total with newly prepared materials. We guess that we could have prepared enough materials for beginner.

4. Experimental Evaluation

The purpose of this experimental evaluation is to evaluate the ease using the dialog function for the reason. Subjects are four Japanese undergraduate students. We let the subject learn the learning

materials on the two conjunction relationships and two *Yari-morai* expression in the system. We conducted a questionnaire that include the following evaluation items after the experiment.

(1) For conjunction relationship: (a) *Usability of the interface for indicating contextual wrong* and (b) *Nature of dialog sentences with CLA*
(2) For *Yari-morai* expression: (a) *Usability of the button for indicating contextual mistake*, (b) *Usability of the button for indicating grammatical mistake*, (c) *Usability of the interface for indicating situational mistake*, (d) *Usability of the interface for indicating grammatical mistake* and (e) *Nature of dialog sentences with CLA*

We got a rating of 4.00 points or more in all items ((a) 5.00 and (b) 4.50 in (1) and (a) 4.75, (b) 4.55, (c) 4.50, (d) 4.75 and (e) 4.75 in (2)). From this result, it is suggested that there is no problem in usability of proposed interface.

We also got some opinion in free description. There was an opinion that it is difficult to understand whether the CLA error is due to situational mistake or grammar mistake. We believe that prior lecture on the focus LF form is necessary before using our system because there are situations that Japanese students cannot judge quickly. Furthermore, we think that it is necessary to implement hint functions, etc. while using the system.

5. Conclusion

We had expanded the reason dialog function for conjunction LF and implemented the reason dialog function for situational reason for solving problem 1 and we had expanded the learning materials for solving problem 2. We prepared about 330 minutes learning contents for all 22 materials. We got a rating of 4.00 points or more in all evaluation items from Japanese students. In future works, we will evaluate the system by abroad student who studies Japanese.

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