

A Teachable Agent for the Japanese Dictogloss Learning Support Environment

Satoru KOGURE^{a*}, Kenta MIYAGISHIMA^a, Yasuhiro NOGUCHI^a,
Makoto KONDO^a, Tatsuhiro KONISHI^a & Yukihiro ITOH^b

^a*Faculty of Informatics, Shizuoka University, Japan*

^b*Shizuoka University, Japan*

*kogure@inf.shizuoka.ac.jp

Abstract: Dictogloss is one of the methods of learning a second language. In dictogloss activity, learners listen to a short text spoken by the teacher, after which they first reconstructs what they have heard individually and then complete the text in discussion with one another. Having already implemented a Japanese dictogloss learning environment without learning partners and a teacher for the beginner level. We focus in this paper on the learning environment for the intermediate learner. We anticipate that the *learning by teaching* method will help intermediate learners to improve their target knowledge. We have thus implemented teachable agent in our previous environment.

Keywords: Dictogloss, second language learning, learning by teaching, teachable agent

1. Introduction

Dictogloss is a multiple skills collaborative activity proposed by Wajnryb (1990). In a dictogloss activity, a teacher reads a short text to learners who try to reconstruct the content of the text individually, after which they discuss the original text together based on their own reconstructed texts. This activity requires learners to exercise the four skills of listening, reading, writing, and speaking. Learners cannot engage in this activity by themselves because this activity is a collaborative learning method, which requires real learning partners and a teacher. We developed a dictogloss system that supported learners' self-study using two intelligent agents as a learning partner (learner agent) and a teacher (teacher agent) (Kondo et al., 2012; Tashiro et al., 2013; Kogure et al., 2015). The system supports the learning of three skills: listening, reading, and writing (without speaking). In the system, a user can use the GUI interface to write the reconstructed text and discuss the own reconstructed text with the collaborative learning agent (CLA).

The reconstruction stage is a phase in which learners discuss the original text based on their own reconstructed texts. In this stage, the learner agent generates its own reconstructed text, which leads the learner to identify his/her errors. The agent engages in discussion with the learner about the reconstructed texts. The learner agent analyzes the learner's reconstructed text to recognize his/her errors based on the architecture of error detection proposed by Kondo et al. (2010). The learner agent generates its own reconstructed text applying a focus on form (FonF) approach. FonF is a pedagogical approach in which a few specific grammatical forms are focused on in a lesson. In addition, it has been pointed out that keywords in a dictogloss text should be given to learners before they listen to the text (Wajnryb 1990). See Kondo et al. (2012) for further discussion.

Figure 1 shows a screenshot of a previous environment (Kogure et al., 2015) when a learner inputs some reconstructed texts into the first sentence (S1 is "It is raining today." in English) and the second sentence (S2 is "And is it usually like this in Japan?" in English). In the left/top area, the system illustrates the situation of the target problem. In the middle/top area, the system shows the chat history with the CLA. In the chat area, the learner's utterance is on the left and the agent's utterance on the right. The agent character "Tsugumi" is in the right/top area. There is a learner's reconstructed text in the left/bottom area and there is an agent's reconstructed text in the right/bottom area. The agent generates a corresponding reconstructed text when a learner inputs each text. In the second sentence S2, the learner compares her/his reconstructed text with that of the CLA and notices that the word

“Hamamatsu” in her/his own text differs from “Nihon” in the CLA’s text. So, the learner clicks the button for the word “Hamamatsu” (in the left/bottom area of Figure 1) to ask the CLA “There is Hamamatsu in S2, isn’t there?”

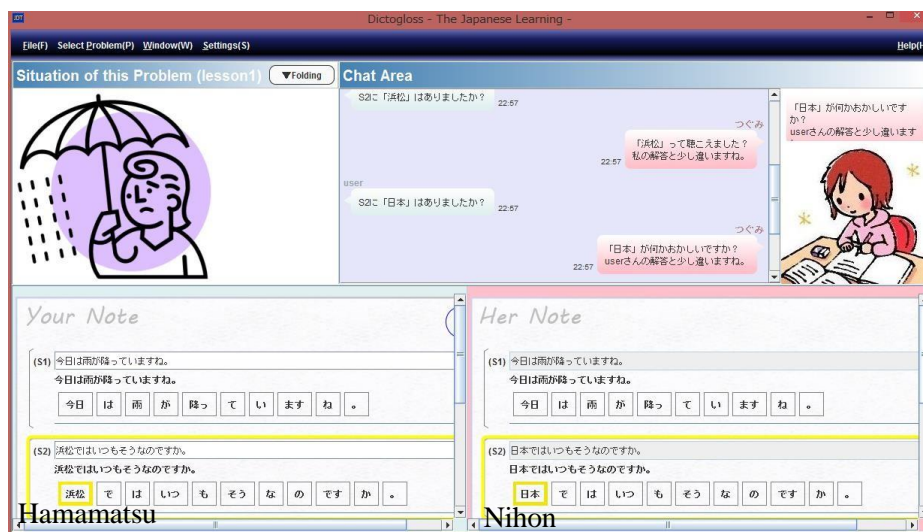


Figure 1. The Screenshot of Previous System.

In this study, we implemented a teachable agent at the reconstruction stage to our dictogloss environment. In our proposed system, a user predicts misunderstanding of the CLA by reading its reconstructed text and teaching her or him the correct representation by pointing out what is wrong in his/her text and what is correct.

2. Proposed Method

We clarify the application scope of the learning by the teaching method in order to realize the proposed environment of use. In this study, we also focus on the reconstruction stage. In the stage, the learner guesses the misunderstanding of the CLA, having observed her/his reconstructed text with the wrong representation. The learner identifies the CLA’s mistake, including what is wrong in her/his misunderstanding. To realize a system that enables the learner to be able to point out the CLA’s mistake, we have three policies, as follows:

- (1) The CLA mistakes are consistent so that it becomes easy to guess the misunderstanding of the CLA for learners.
- (2) The CLA changes the misunderstanding according to whether a learner’s reconstructed text is wrong or correct because we focus on a form that a learner has used correctly and perhaps understands.
- (3) The learner is able to seamlessly migrate the existing learning situation and teachable learning situation in order not to place an excessive burden on her/him.

We take up the honorific representation in Japanese as a learning target item because learners cannot independently determine a reason from the surface mistake of the reconstructed text by the CLA since the Japanese honorific representation is a little difficult for them. We discuss the following three attribute forms of honorific representation in Japanese. “Humble form” is a form used when the speaker wants to convey her/his inferiority to the recipient. “Honorific form” is a form used when the speaker wants to convey her/his respect to the recipient. “Polite form” is a form used when the speaker wants to make own words sound gentle to the listeners. So, the learner can discuss the correctness of honorific representation using the situation in the correct text (e.g., a learner can mention that the “honorific form” is wrong in a situation in which the recipient is the worker and the speaker is her/his boss.)

There are three types of reasons for a learner or CLA mistaking the surface of honorific representation as follows:

- (A) A learner or CLA misunderstands the situation of a short text spoken by the teacher. Especially, s/he misunderstands the social relationships of each character that appears in the short text.
- (B) S/he misunderstands an honorific rule corresponding to a situation. For example, s/he misunderstands that the humble form is a form used when the speaker wants to convey her/his respect to the recipient. (Correctly, this form is the honorific form.)
- (C) S/he misunderstands a suitable surface representation for an honorific attribute form. For example, s/he misunderstands that “*ossaru*” is an honorific form of the verb “*iu*” (meaning “say” in English). Correctly, “*ossaru*” is a humble form.

We focus on reason types of (B) and (C) because our system presents a situation with a simple image and simple description written in the learner’s native language in advance. Due to limitation of space, we omit to explain the reason types in detail. In our proposed environment, the learner learns the honorific representation using our learning environment with the function of previous works. The system migrates the new mode for learning by teaching if s/he can properly use the honorific representation. The system determines that the correct rate for using honorific representations exceeds 70% (a value that we decided on heuristically). When the system migrates the learning by teaching mode, it decides the mistake type of the CLA from 18 patterns. The system generates the mistake representation of honorifics according to the decided mistake type. We developed a proposed environment in order to extend our previous environment. We implemented seven new modules and five new GUI interfaces to the environment. In the environment, the learner can only use the GUI interface by inputting her/his own question or description to the CLA in the same way as the previous one. We prepared three lesson packages, and confirm that the environment correctly performs in prepared three packages.

3. Conclusion

We designed a Japanese dictogloss environment for intermediate learners, in which we focus on the learning by teaching method, implementing a dictogloss environment to be able to support the method. We set the target learning form as Japanese honorific representation. In the environment, the CLA misuses honorific representation and the learner attempts to persuade her/him to make corrections.

In the future, we must perform an experimental evaluation with foreign students, focusing on the speaking skills. Especially, we will extend the environment to be able to use speech in the reconstruction stage.

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