

An Implementation of Interactive Environment for Learning by Question-Posing

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Abstract. In this paper, we describe an implementation of interactive learning environment that promotes learning by question-posing in English learning for beginners. The learning environment supports learners to pose question and answer sentences. We have also implemented authoring module of the question-posing exercises.

Keywords: Question-Posing, English Learning, Agent-Assessment

1. Introduction

Several investigations have already suggested that question-posing is one of the promising learning as well as problem-solving activities. In learning by question-posing, assessment and feedback for the questions & answers posed by learners are important issues. We have investigated the function of automatic assessment of questions & answers posed by learners in technology-enhanced learning [1]. In this paper, we will introduce an implementation of interactive learning environment for learning by question-posing composed of learning module and authoring module.

2. Module for Learning by Question-Posing

By using the following sentences as an example, the flow of question-posing is explained.

Australia has many kinds of interesting animals. Koalas are very popular. They sleep during the days. Look at the mother koala in the picture. She has a baby on her back.

After reading and comprehending the sentences, a learner is required to select a clue word that should be included in the question and/or answer the learner will pose. In Figure 1, the learner is selecting the noun 'Australia' from the list of clue words at the right side of the interface.

In the second step, the system generates pairs of questions and its answers from the sentences. For instance, when a learner has already selected the word 'Australia' as the clue word, the system generates several questions and answers including 'Australia' from the sentences. Following two pairs are examples that are generated by the system.

What has many kinds of interesting animals? -----Australia does.

How about koalas? -----koalas are very popular.

Currently, the target questions are restricted in interrogative pronouns, that is 'who', 'what', 'when', 'where' and 'how'. In order to promote the question-posing, the environment provides the learner with a list of interrogative pronoun and requests to select one of them. In this example, selectable interrogative pronouns are 'what' and 'how'. If the learner selects other interrogative pronouns, that is, 'who', 'when', or 'where', the system indicates that it is impossible to pose questions and answers with the interrogative pronoun for the current sentences. Here, it is assumed that the learner has selected 'what'.

In the third step, the system provides the learner with a set of words that is enough to pose a question correctly, and the learner is requested to compose a question sentence with the words shown in Figure 2.

In the fourth step, the learner arranges the words to generate a question sentence. In the assessment, the generated sentence is compared with the prepared correct question. Here, the learner should generate the correct question as: *‘what has many kinds of interesting animals?’*

3. Authoring Module

If some of the generated questions and answers are inadequate ones, it is necessary for authors to select adequate questions and answers from the list of questions and answers that automatically generated. Here, the task to generate questions and answers is simplified to the task to select them from the list of sentences. It is also possible to modify the selected ones. As for clue words, authors can select adequate ones from the list of nouns derived from the original sentences.

In Figure 3, sentences of the questions and answers generated by our system are shown in the area of ‘expert sentence’s panel’ on upper-right hand. While, author clicks one of the generated sentences, the clicked sentence would appear on the ‘modifying sentence’s panel’ below the figure. The author can modify the sentences by changing, rearranging or deleting the words and can also save and delete the sentences.

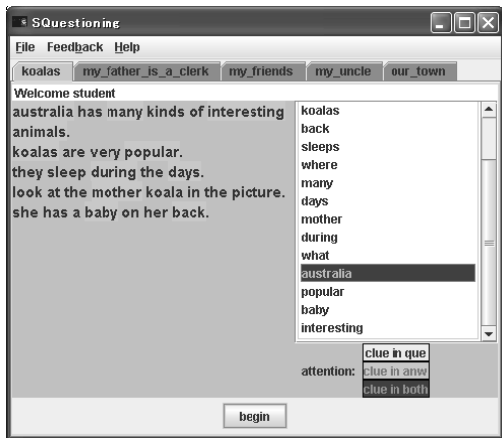


Figure 1. Selection of a clue word.

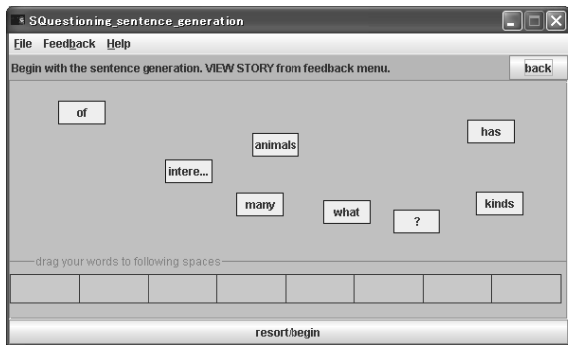


Figure 2. Words as components of a sentence.

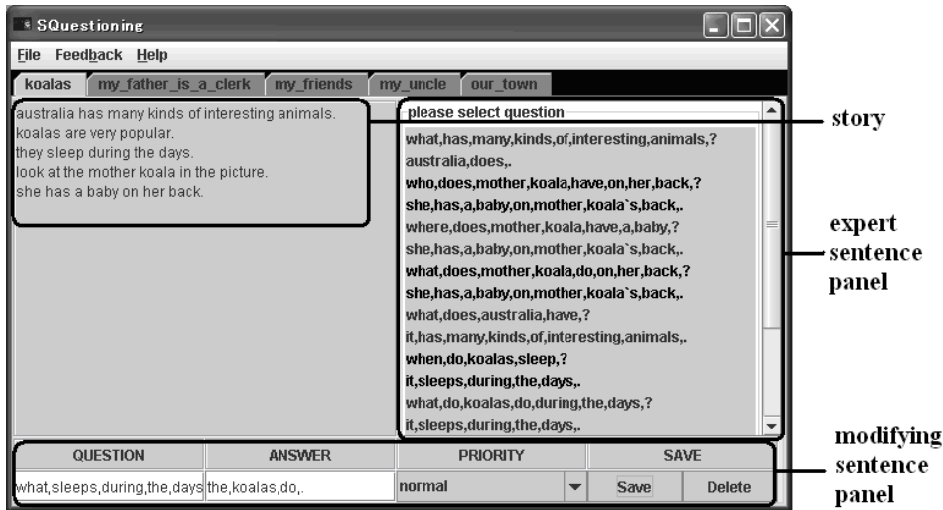


Figure 3. Sentences Modification Function.

References

- [1] Baowei Lin, Tsukasa Hirashima , Hidenobu Kunichika: Interactive Question-Posing Environment for Beginners' English Learning, ICCE2010(accepted).