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Designing a Scaffolding-based CALL System with corrective feedback

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Abstract: With the development of the technology today, more advanced and powerful Computer Assisted Language Learning (CALL) systems are applied into language learning classroom to help students acquire English ability. However, several surveys show that some CALL systems are lack of theory-based and corrective feedback to meet pedagogical requirement and indicate learners' language faults. Thus, this paper presents a theory-based student-centered CALL system to support elementary school students learning English. The framework contains four parts elements and it is developed based on the scaffolding theory. The learning activities are set as main-scaffolding to support step by step individual learning and the corrective feedbacks are set as sub-scaffolding to give learners detail explanation of how to correct their language faults.

Keywords: Computer Assisted Language Learning, scaffolding learning, corrective learning feedback

Introduction

With the development and process of the technology, the application of using information technology to enhance language learning provides opportunities with learners and teachers to experience more efficient learning. The term of Computer Assisted Language Learning (CALL) appeared around 1980s. The characteristics of its individualized, student-centered and low-anxiety learning environment have been proved that applying the CALL system in enhancing language learning could improve learners' performances [1]. However, not all CALL systems are well designed and meet pedagogical requirement [3]. The corrective feedback to indicate learners' incorrect use of target language is required but insufficient [1]. Studies show that without providing students with the feedback to analyze and correct their language error may result in fossilization and hard-to-break habits [4]. Furthermore, the issue on how to design the corrective and specific feedback for learners is still a dispute and under discussion [1] [2] [4]. Thus, the paper aims to propose a framework of scaffolding-based CALL system to enhance elementary school students' English speaking ability (Figure1). The framework contains four parts elements including theory-based part, learning content design, feedback design model and the implication of automatic speech recognition.

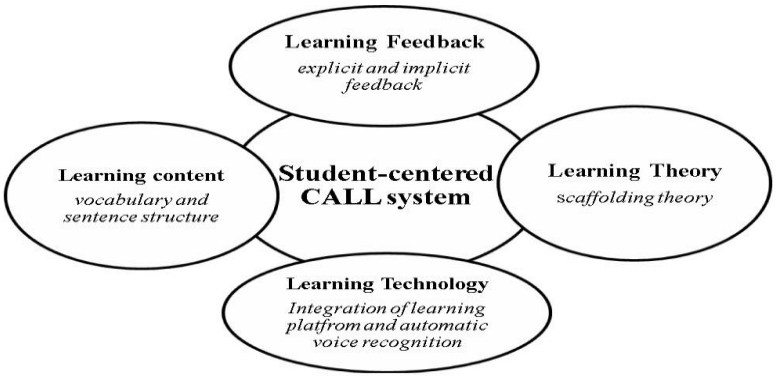

Figure 1. The four elements of the system

1. The framework of learning student-centered CALL system

The student-centered CALL system developed in this study is based on a web learning environment. Learners have to download the ASR-package from the server and then install the program on their personal computers. After they install the speech add-in program, the computers could process the speech API for speech recognition. When learners access to the learning website, the speech plug-in could decode automatically and run the speech recognition (Figure 2).

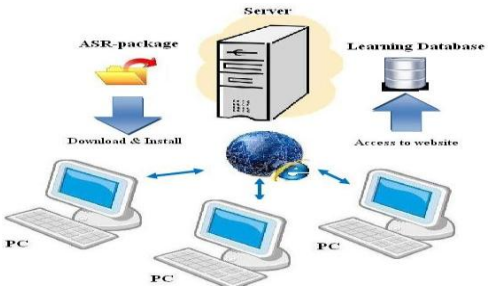

Figure 2. The architecture of the student-centered CALL system

2. The learning flowchart and feedback design of the CALL system

The concept of scaffolding learning is applied into designing the learning activities and corrective feedbacks. The learning activates on CALL system are set as main-scaffolding that aims to support learners learning the English vocabulary and sentence pattern. The corrective feedbacks are set as sub-scaffolding to give learners detail explanation of how to correct their language faults and then provide learners with more vocabulary with the similar pronunciation to enhance and connect their vocabulary knowledge network.

2.1 Main scaffolding: learning activities

There are three activities in the CALL system and the activities are arranged according to the scaffolding framework. The first level of scaffolding is vocabulary learning. In this stage, learners have to learn the given vocabulary and then practice the pronunciation of the words. The second level of scaffolding is sentence pattern learning. In this stage, learners will learn a simple sentence which is composed by the vocabulary they learnt at first scaffolding stage. They could repeat the English sentences and replace the key words within the vocabulary they learned in the first stage. The third level of scaffolding is self-testing quiz. In the quiz, learners have to correctly pronounce each given vocabulary and sentences without any hint, and a summary and comment of learners' performances will be provided after learners finishing the quiz.

2.2 Sub scaffolding: corrective feedbacks

The implicited and explicited corrective feedbacks of each stage are also conducted. The purpose of implicit feedback is to prevent students from being irritation and feeling disappointed while making faults and the explicit feedback could provide learners with directly information about how to modify their language faults [5]. Thus, the researchers applied three structural feedback mechanism as sub-scaffolding of the system to help students aware and correct their pronunciation error. Among the three sub-scaffolding feedbacks, the implicit feedback, recast, represents learners utterance to help them aware of the difference between learners' pronounce and the target word. Then, two explicit feedbacks are showed to indicate students' incorrect pronunciation and instruct them to

modify their language errors. An illustration of the learning activities and feedback mechanism could found in Figure 3.

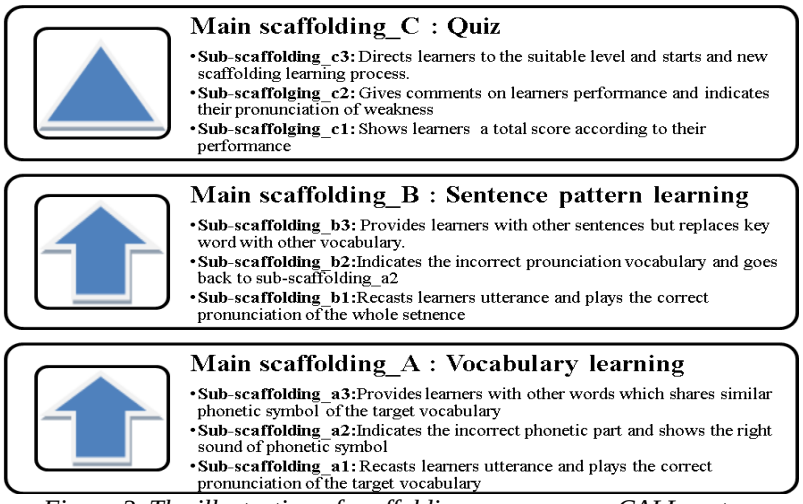

Figure 3. The illustration of scaffolding processes on CALL system

3. Discussion and Future work

This paper has discussed the framework of scaffolding-based CALL system to support elementary school students learning English speaking. Since some of CALL research lacks of theory-based pedagogical design, and it has been indicated that digital waveforms or short comments seem not proved to be effective and comprehensible for providing learners with useful information in correcting their language errors. The authors try to summarize the suggestion from related CALL study and then apply the concept of scaffolding theory, language feedbacks, both of implicit and explicit forms, and the state-of-the-art technology, automatic speech recognition technique to propose a more complete CALL framework. Several concerns arise from this on-going study such as the fact that English students are in different learning styles and at different language proficiency. Thus, the adaptive learning fumction could be included in the system to make sure the whole design of the learning flowchart can adjust to the needs and different achievement of the target learners. Next steps in the construction of this research will focus on software implementation and collection of results. It is our hope that elementary school learners could be benefit from the interactive and individual learning environment to achieve better English performance.

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