CAL interface design for young children: a case study in literacy

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A Computer Assisted Learning (CAL) system for children must provide a particularly simple and intuitive user interface if it is to be an effective teaching aid. However, design rules and guidelines for the development of interfaces for children are still being established. This paper proposes several such design principles and tests them through the implementation of a CAL literacy application. The application has been evaluated in practical use by children and teachers in the classroom.

The paper discusses the challenges of designing for children at a pre-reading stage and evaluates existing guidelines and techniques which have been developed for adult users. The paper suggests guidelines and techniques to deal with the unique challenges posed to the CAL application designer by young children. Relevant issues include multi-modal communication, help, the need to retain interest in a busy classroom and adapting to the needs of the child.

An application covering a subset of the national curriculum strategy for literacy at reception level was developed using the proposed guidelines. This enabled an experimental evaluation of the application to provide a preliminary assessment of the proposed guidelines and their implementation.

The provisions of help and of feedback on students' responses to questions are key aspects of the user interface. As well as clear visual feedback, the application provides user feedback using speech generation to provide a more natural interaction with the user. A tiered help system encourages the children to attempt the questions rather than giving up and waiting for the answer to be revealed.

The application enables users to progress at their own pace and practise areas of weakness through the use of individual profiles which can be setup by the teacher using a separate interface. The provision of this interface to customise the activities for each child enabled the children's interface to be simplified.

The results of the evaluation were very positive as all the children were able to easily navigate the system. The tiered help was shown to be effective when activated but the mechanism used to trigger the next tier of help relied on a question being answered incorrectly. Due to the children's reluctance to answer a question they were not sure of, the help trigger mechanism was found to be ineffective. The results showed that the ability to set individual profiles for each child and each activity benefited the children without placing an excessive burden on teachers. The paper concludes that further work is required to test the validity and robustness of the guidelines by using them to develop a range of CAL systems.

Keywords: CAL, Literacy Tutor, Children, Interface Design Guidelines.