

A computer based letter formation system for children

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ABSTRACT

Learning to write requires letters to be formed using a particular sequence of pen strokes. Teachers are unable to continually monitor large numbers of children to ensure that they are using the correct sequence. A computer application has been developed to monitor the child's progress and provide appropriate feedback when required. This paper discusses the computer application which will be demonstrated to the conference delegates.

Keywords

Letter formation, Children, Computer Assisted Learning

OVERVIEW

Children are usually taught a letter sequence by tracing around a dotted outline with the aid of arrows. However, checking that the child formed the letters in the correct sequence is difficult for a teacher as it is not possible to monitor all of the children all of the time.

A computer application to assist in learning correct letter formation has been developed using published design guidelines [3] and evaluated in the classroom. The child selects a letter to practice from a menu. A single graphical letter is displayed and the child draws round it using an appropriate input. For a child who finds dragging a mouse difficult, a segmented version of the letter can be selected which enables segments to be clicked to form the letter.

It has been shown [2] that a substantial improvement in handwriting quality was found among children with writing difficulties who received instruction based on learning letter forms using visual/verbal prompts; a computer is an ideal environment to provide both.

Using a Computer Assisted Learning (CAL) scheme has advantages when practicing letter formation: the child is unable to form letters in the wrong sequence and they get individual verbal and animated help as and when they need it. Various input devices can be used depending on the dexterity of the child such as a finger on a touch screen, a graphics pen and tablet, mouse, track ball etc.

The flexibility of a computer enables the letter formation sequences to be changed depending on the writing scheme being taught, or to help left handed users etc. There are two

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popular letter formation methods in use today: Zaner-Bloser and D'Nealian. Although studies have shown that neither appears to be fundamentally better than the other [4], both schemes are widely used in schools and both rely on learning a specific sequence of pen strokes. A benefit of a computerised system is that it is easily adaptable to either scheme or any other scheme that may be introduced.

Practice through repetition, feedback and reinforcement is essential if the skill of letter formation is to be mastered; a computer is an effective environment in which to practice as the user need not be supervised but can be still monitored. Although "drill and practice" methods tend to have little pedagogical substance, they are effective in developing basic skills which enable the learner to move forward to develop higher order cognitive skills. To become writers, children have to learn that writing involves the translation of spoken sounds into written symbols which must then be put onto paper [1]. The demonstrated application provides a more enriched and less tedious form of "drill and practice" whilst enabling the association of letter sounds and shapes to be learned concurrently with the development of correct letter formation.

THE FUTURE

Schools are generally unable to provide a PC for each child so future work will consider a more economical solution using a PDA (Personal Digital Assistant). The software will be ported to the PDA and provide a similar interface to the demonstrated software. The child will draw around the letter using a stylus to simulate the use of a pencil.

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