

WriteSpell: Personal technology to support dyslexia among primary age children

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## WriteSpell: Personal Technology to support dyslexia among primary age children

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A project was undertaken to study the needs of primary aged children with dyslexia, how technology is already used to change the way they learn, and to discover how it could be further improved. The result of the study is a software requirements specification and prototype of a solution.

The right software can help dyslexic learners be more independent and to produce work commensurate with their level of study. Three issues in designing software for the dyslexic learner are prevalent: improving literacy ability, increasing productivity, and raising self confidence. In the past, primary aged children with dyslexia have been taken out of class for extra help or coaching. A more recent approach is to include children within their classrooms which has led to a new method of 'differentiated' teaching, so children of all abilities can learn at the same time.

Inevitably, despite the best efforts of the class teacher, a child cannot receive as much support during a lesson as they would in one-to-one or small group sessions. Clearly there is an opportunity for technology to provide some of the extra support needed.

The existing software generally falls into two categories – tutoring and assisting. There are a number of games for teaching skills such as typing, spelling and grammar. There are also simplified word processors, some with text-to-speech, word-completion and spell-checkers that recognise typically dyslexic mistakes.

Some specialists were concerned that the best assistance tools took away the need to learn to spell, and children became over-reliant on them. Ideally a teacher helps whenever a problem occurs, and encourages the child to learn the word. They were also concerned that tutoring exercises do not tie-in with the current classroom topics, or the current challenges facing the children.

The classroom teachers' main concerns were that they did not have time to supervise computer use, and found planning and monitoring individual progress almost impossible. Often limited budgets for licences means the computers with the relevant software are in another room. Teachers also found parents keen to buy tutoring software for home, but the activities competed against what was being learnt at school.

The parents felt they were not receiving enough feedback on progress from the school and they found it difficult to help their children informally at home without taking on a teacher role.

The children's primary concern was that they use the same software as everyone else. They did not want separate 'babyish' word processors. They wanted more help in class to learn new words but could not always ask either because the teacher was busy or through embarrassment. They also found that learning lists of words on the computer was pointless or irrelevant. They would rather learn words as and when they needed them.

In response to these comments, a set of requirements emerged which informed the design of an integrated learning package. First, the system must integrate assistance and tutoring. Second, it must link class work with the activities the child does at home, and third, it must involve the children, teachers, parents and specialists.

WriteSpell, the prototype solution was developed with these three main criteria. In the classroom, the child writes using standard word processing software. WriteSpell helps to complete or correct a word either on demand or when a mistake is made. Having chosen a word from a written or spoken list, the child is encouraged to do a 'look-cover-write-check' exercise or play a game to learn the word. Success is rewarded with praise and positive encouragement is given for mistakes.

Whilst the child is working, WriteSpell monitors progress. A Personal Profile is built up that logs common mistakes, regularity of success/failure, number of words in child's written vocabulary, number of attempts taken to get a word correct, and much more.

After a writing session, WriteSpell assesses the information and based on a set of pre-defined criteria, together with options set by the Advisory Teacher will generate relevant exercises and games based on the particular difficulties experienced, and in harmony with the child's current study. The games can be played at home, where the parents may join in.

The balance of assistance versus tutoring can be controlled. There is a hierarchy of control: specialist, teacher, parent and child. However, the child has enough scope for control, so he does not feel dictated to. The software can be installed on any computer, and the user profile can be transported on a floppy disk or as an email attachment. Because the child's activity is monitored on every computer with WriteSpell and the child's profile installed, the level of assistance and tutoring can always be up-to-date and relevant.

At any time, people with a direct interest in the child's progress can obtain a relevant progress report. The child can see how many words they have learnt, to build their confidence. The class teacher is given some detail about the types of words that the child finds most difficult. A printout of written work for the teacher also shows which words the computer helped with and which ones the child has learnt whilst writing. The parent can obtain an overview of the general difficulties, and recent progress. A specialist can obtain an in-depth report on all words that the child has used, and what difficulties they have had.

The interface has been designed for ease of use, and strong visuals eliminate the need for reading instructions. Early results from user trials are promising. The participating children enjoyed using the software. They liked the assistance that the system offered and were motivated to learn to spell words correctly. They were enabled to incorporate words that are normally too hard into their work, and to learn them at the same time. Being able to write at a level closer to their real ability gave them a great confidence boost.

Further implementation of the requirements, particularly the reporting mechanism is needed, followed by a long-term study to validate the learning gains and other benefits or effects of using WriteSpell.