Designing a Handwriting Recognition Based Writing Environment for Children

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This paper reports on a study in a primary school classroom in which children in year 3 (age 7 and 8) were observed writing. The writing was carried out in three modes. The first mode, pen and paper, was familiar to all the children; the second, using the computer keyboard was less familiar, and some children found the technology difficult to master. A third mode was new to all the children, and used a Wacom graphics tablet and pen to input text to a word processor using handwriting recognition technology.

The children were engaged in free writing activities. Some of the work they did was part of a literacy class; the rest was work that had been set during history and religious education. The classroom environment was unaltered during the trial, which meant that children sometimes interacted with each other, and suffered distractions and interruptions.

The research focused on the mistakes and slips that the children made, together with the amount and the 'quality' of output from the writing task. Of particular interest was how the children made, discovered and recovered from their own errors and how, in the recognition interface, the children dealt with system errors.

During pen and paper writing, the children overwrote, rubbed out or scribbled out errors. Many errors went un-noticed, and children confessed to ignoring some errors as they had got fed up making corrections. Using the keyboard, the written text was more visible and a higher proportion of errors was spotted by the children. Correction strategies included deleting back to the error, and positioning the cursor then editing. Most of the errors were corrected. The handwriting recognition software produced what may be termed 'system' errors, when the writing was difficult to recognize. Children quickly adapted their style of writing to improve recognition. They became aware of their own 'problem letters and styles' and worked on improving them. Error recognition was similar to the work at the keyboard, and children used the keyboard backspace key to rub out errors, but rewrote them using the pen.

Each child was asked about the technologies and their satisfaction has been measured using metrics previously developed by the authors. The information from this study has informed the design of a pen-based computer writing environment, which will subsequently be developed into a prototype. This design is described in the paper, together with the rationale for the design decisions made.