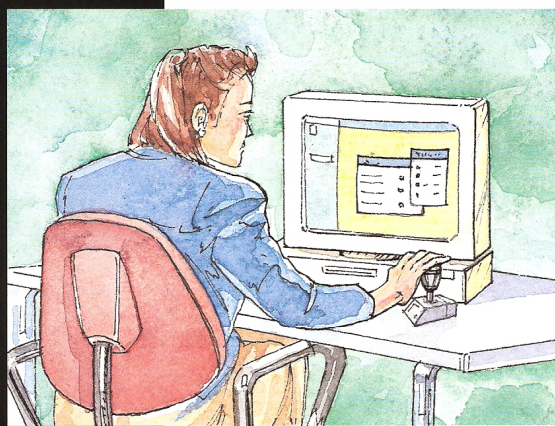


LEARNING TECHNOLOGIES

Computers and Disability

THE ENABLING COMPUTER

The severe physical disabilities caused by conditions such as cerebral palsy and motor neuron disease can turn the everyday tasks associated with work or study into disproportionately time-consuming activities. Disabled children at school are often reluctant to produce long pieces of



work because of the amount of time it takes. Similarly, disabled adults who need to type at work can find progress frustratingly slow.

Developments in Open Learning, particularly in computer-based training, are already benefiting the physically disabled. The Employment Department has recently funded several projects designed to help the physically disabled to function more independently, particularly through the development of techniques to make word-processing and typing easier and the printed output more accurate.

The PAL (Predictive Analysis Lexicon) family of systems and SAW (Switch Access to Windows) package are two such projects which have enabled the disabled user to increase the quantity and quality of word processed material with significantly reduced effort. Both projects are already benefiting the disabled and able-bodied communities alike.

The Predictive Analysis Lexicon

PAL has been in existence for several years and was originally designed for people with a severe physical disability. The primary aim of the system is to reduce the number of key-strokes required to produce a printed document. The system works by predicting the word to be typed on the basis of the letters already on the screen. A list of words is offered and continually modified as the user enters more letters.

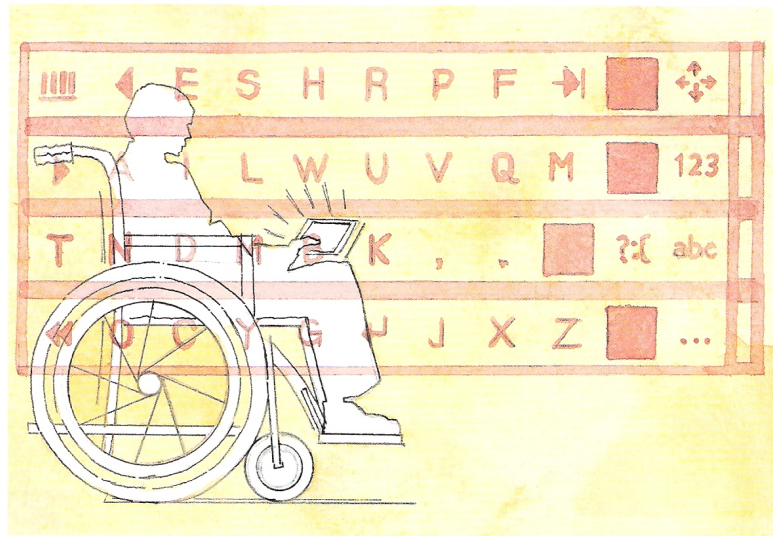


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LEARNING METHODS CASE STUDY



Research confirmed that between 30 and 60 per cent fewer keystrokes were needed when using PAL. Spelling mistakes were reduced by some 65 per cent and reluctant writers were encouraged to produce longer pieces of work.

It was this success which prompted the decision to enhance PAL and to create a family of software packages that would extend the system's usefulness.

Syntax PAL, PAL speller and talking PALSTAR are three software products that have taken PAL one stage further.

- **Syntax PAL** is an enhancement of the PAL system of word prediction. Automatic word selection is improved by taking account of the grammatical status of the

preceding word (for example, only nouns will be suggested if an adjective is already on the screen).

- **PAL Speller** was developed to overcome the problems that arose when the user's incorrect spellings were mistakenly added to the user dictionary. What distinguishes PAL Speller from standard spell-check facilities is that it was designed to cope with the phonetic spelling mistakes that characterise the work of many disabled writers, in addition to the standard ones. Initial research indicates that PAL Speller can supply 51 per cent of correct spellings on the first prediction and 84 per cent within five.
- **Talking PALSTAR** is a word processor developed for use with PAL. The addition

of a voice synthesiser means that every letter or word that is typed is also spoken. PALSTAR is also able to read whole sentences and paragraphs.

The most important achievement of the PAL family of software packages is to enable physically disabled people to be more productive with far less effort. However, wider benefits are already emerging and PAL has been successfully used with children and adults with spelling and language difficulties.

Switch Access to Windows

For the able-bodied user, typing mathematical formulae and creating geometric shapes on-screen can be achieved easily, using a combination of mouse and key-strokes. For a disabled user with limited motor control producing these symbols is often impossible.

The project carried out by the ACE Centre in Oxford set out to make it easier for the disabled to do mathematics through the Windows 3, multi-tasking environment for PCs. The project aimed to:

- enable disabled users to process mathematical formulae and geometric shapes as well as words
- provide an efficient switch access which would enable users to be productive without depending on a keyboard.

SAW enables the severely disabled user who can only operate a switch to make use of

applications running under Windows 3, an ideal environment for allowing disabled users to combine text with mathematical and geometric symbols.

SAW is a tool which allows 'selection sets' to be designed for the switch user. One 'set' displays the letters of the alphabet in a matrix of four rows by six columns. A highlight bar travels automatically along each row and then across each column. It takes only two movements of the switch to select the letter required.

Selection sets can be devised for any series of choices and can, for example, be used to create an on-screen calculator. Selection sets can be created for any application that runs under Windows 3. SAW is so flexible that it can easily be modified to suit the needs of an individual user.

SAW and PAL are examples of the way in which computer-based training techniques can be adapted and developed to meet the needs of a particular special needs group. By enabling the disabled to use computers as effectively as able-bodied people, these two projects have made a significant contribution to the employment and training prospects of an important group of people.

This is one of a series of three Case Studies exploring the use of Open Learning to train people with special needs. 'Look and Learn' and 'English Without Tears' describe Open Learning projects with those with a hearing impairment and literacy problems respectively.

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