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Are you pedalling your Ferrari?

In the spring 2004 edition of Broadcast I wrote about how some of the standard features within Windows and free downloads can be used as effective tools to comply with the Auxiliary Aids part of the Special Educational Needs and Disability Act 2001 (SENDA) and, more importantly, how they can be used to make computing more accessible.

In response to the interest I received from that article I felt compelled to expand on the benefits that assistive technology can bring to learners, in particular the range of keyboards and alternative interfaces that can meet a range of learners' needs. As always, the main impetus of the article is to promote the idea that assistive technology should not be confined to learners who have a disability or reading and writing difficulties, but should be viewed as something that can benefit everyone.

The 'Reasonable Adjustments' and 'Auxiliary Aids and Services' sections of the Special Educational Needs Act 2001 (SENDA) serve to highlight the responsibilities of education and training providers, in terms of making their learning and services more accessible to disabled people. However, it has always been my contention that if these sections are implemented with careful planning and preparation, especially where ICT provision is involved, these adjustments and aids can facilitate genuinely inclusive learning for all.

Taking a quick glance around your work room or nearest computer suite will reveal the extent of ICT facilities in terms of accessibility provision for learners. If you see rows of computers grouped together attached to their respective keyboards and mice, you might be forgiven for thinking that this is the norm. In fact, whether you went into a Call Centre, a public access facility such as a library, college or university, you would come across a similar scene time and time again.

Nothing unusual about that, you might think. Well, maybe not, but let's take the standard keyboard with the QWERTY interface as a starting point. Did you know that this arrangement of letters, along with the other 20 on the traditional keyboard were arranged that way to make the job of typing more difficult? 'More difficult!', I hear you say, 'Isn't my life difficult enough?' The first commercially successful typewriter was developed over 130 years ago. Originally, the keys were arranged alphabetically but as people became increasingly proficient at using the keyboard the keys would stick or jam when struck in quick succession. This was overcome by placing the most frequently used keys as far apart from each other in order to make the job of typing as slow as possible.

Herein lies an irony. Most modern computers can process information at thousands and thousands of kilobytes per second and are streamlined for maximum efficiency. Yet, 130 years later we find ourselves unquestioningly using an interface designed to slow us down! Is anyone out there out-typing their Pentium 3 or Pentium 4 computers? I might be accused of exaggerating but I would compare it to pedalling a Ferrari!

The Royal National Institute for the Blind (RNIB) recently highlighted the problem of

standard computer equipment when it argued that 'designers often fail to recognise the rights and access requirements necessary for people with disabilities' (RNIB 2000). A further irony lies in the fact that standard keyboard competence is often seen as a benchmark, for learning to use the computer and for achieving success at school or at college or university, and as a prerequisite for gaining and retaining employment.

The importance of ICT in education was highlighted in BECTA's 'The Digital Divide – A Discussion Paper' where it contended that 'the proliferation of ICT in education and the expansion of Internet-based information and services further amplify the chasm between the information 'haves' and 'have nots.' For many people the standard keyboard is very inaccessible and can quickly force them down the 'have nots' road. (BECTA 2001) In a government paper published by the department for Education and Employment, 'Bridging the Digital Divide', it argued that 'changes in education are likely to mean that ICT skills will become the 'indispensable grammar of modern life' and a 'tool for lifelong learning'.

Yet despite these changes taking place in ICT and education and the opportunities they present, we still seem to have this fixed idea in our minds that the 'indispensable tool' and primary means of access to education and employment is a standard keyboard and mouse.

If the QWERTY keyboard is designed to make life difficult for us and to slow us down, what impact will it have on someone who has a problem with fine motor control, or a mature student returner who has had a stroke and only has the use of one hand, or on someone with cognitive difficulties? And what about those of us who are left-handed (and I include myself here) and find using a keyboard which has been designed for right-handed people awkward and inefficient? The QWERTY keyboard can often compound a belief that 'I'm no good at computers', the consequences of which are all too familiar for those people who experience barriers in other aspects of their lives.

The reality is that keyboards come in all shapes and sizes, for example, alphabetic layout, lowercase, large keys, high contrast keys, keyboards that can be split in half and/or raised to a variety of levels. There are keyboards for left-handers, one-handed, virtual or on-screen, keyboards that can be contorted into a range of shapes and positions and even keyboards that claim to be indestructible! It is even possible to configure your QWERTY to Dvorak which is renowned for increasing typing speeds and improving performance, especially for touch typists. Dvorak has been an integral part of Windows since Windows 3.1 and 95. You can find out how to configure your keyboard to Dvorak by visiting this link: http://www.microsoft.com/enable/training/windowsxp/keyboardlayout.aspx

One alternative to QWERTY is the Tash USB King Keyboard. This is an adaptive keyboard which has a 'frequency of use' layout and has been designed to increase typing speed. On this keyboard word beginnings and endings are grouped together, e.g. 'the', 'ing', etc. The Tash USB King has many other useful features, for example, a built-in integrated control for both keyboard and mouse functions. Its large keys are slightly recessed, and provide both tactile and auditory feedback. If required, the USB King can also be operated with the foot, a toe, a heel, or the back of a hand. More information on the Tash USB King can be found at: http://www.tashinc.com

Another example of an adaptive keyboard is Intellikeys. This is a versatile keyboard for learners who have difficulties using a

standard keyboard or mouse. It enables learners with physical, visual, or cognitive difficulties to type, enter numbers, navigate on-screen displays and execute menu commands by using 'overlays' which slip into the front of the Intellikeys keyboard. While there are five standard overlays with a selection of QWERTY and ABC in both upper and lowercase layouts, there are also overlays for numbers and mouse movement. Using a software application called Overlay Maker it is possible to customise overlays to suit individual needs. To find out more go to: http://www.inclusive.co.uk

My personal favourite, mainly because I'm left-handed, is the Cherry G84 Compact keyboard. It is particularly useful for people who can only access a keyboard with one hand. If required, it is possible to fit an external number pad which can be positioned to the left or right of the keyboard, which is great for left-handed users who need to do a lot of number inputting. It also has a number of other benefits, for example, it fits easily onto a wheelchair tray (the standard keyboard tends to be too big) with room to spare for a standard mouse or trackball.

This is particularly useful for learners who use a wheelchair and are unable to get access to a height-adjustable table; the Cherry compact and respective mouse can comfortably fit onto a wheelchair tray and are easily connected to the computer by attaching extension cables between the keyboard and serial/USB ports. Fitted with a keyguard, the Cherry compact can be particularly useful for learners who have difficulties using a standard keyboard and at £50.00, can be a much cheaper alternative to dedicated one-handed keyboards.

Of course there are a number of other ways of accessing a computer, rather than the keyboard. These include voice-recognition, infra-red head tracking, trackballs, and switch input systems. But keeping with the theme of keyboards, there are a range of on-screen keyboards which provide an alternative to the problems associated with physical keyboards – some of which were reviewed in last spring's issue.

A virtual or on-screen keyboard displays a picture of a keyboard on the screen. The display can include keyboard keys, a cell or button all of which can be selected from the on-screen keyboard by pointing or dwelling over the item with a mouse, trackball or other pointing device. It is also possible to select an item by using scanning and switches. Text is transferred or 'typed' into the program being used by the learner e.g., a word processor, spreadsheet etc. Ideally on-screen keyboards should be resizable and/or have word prediction to increase input. Examples of on-screen keyboards include Wivik; www.wivik.com, Penfriend XP; www.penfriend.ltd.uk, Click-N-Type which can be downloaded for free from www.lakefolks.org/cnt , Madentic, the developers of the Microsoft on-screen keyboard; www.madentic.com, Clicker reading and writing software; www.cricksoft.com/uk/ and The Grid, for learners with more complex needs who require a switch to access a computer; www.sensorysoftware.com.

On-screen keyboards can be particularly useful for learners who are unable to glance repeatedly between the screen and keyboard as it can be positioned on the screen in a way that suits the learner's needs. There are many on-screen keyboards which can provide full independent control of a computer by simply hovering the mouse pointer or clicking a switch. The wonder of assistive technologies is that they are able to break down so many preconceived barriers to learning and open a new world of possibilities.

So, take another look at your computer suite and think how much more accessible and inclusive it could be with just a few simple changes. To limit assistive technologies to a stand-alone workstation or to an accessible computer suite is to miss the opportunities and potential that these tools can offer to all learners. Inclusion is about integrating assistive technology throughout the learning and work place so that these tools become the norm rather than the exception.

If you are lucky enough to have a Ferrari, do yourself a favour; throw those pedals away, rev up your engine and do some real driving!