

To investigate and then develop an ICT innovation to support students who are dyslexic when applying for Disabled Students' Allowance (DSA), thus enabling them to be more independent.

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Introduction

This project is in response to research carried out in 2007 with students who are dyslexic. This research investigated the barriers experienced by students in higher education who are dyslexic when accessing the Disabled Students' Allowance. Reference is made to their comments throughout the text. The research identified one of the areas that they find difficult. This was the form they need to use to apply for the Disabled Students' Allowance. The innovation has been designed to support this difficulty.

An important thread running through the whole of this project is to help the student who is dyslexic to be in control, to feel valued and so to improve confidence and self-esteem.

Aim

The research that was carried out as a precursor to this innovation has developed understanding of the situation in which these students who are dyslexic find themselves. Therefore the aim of this project is to respond to this research. As Burton and Bartlett (2005) state '... research is political because it seeks to make a difference...'. Therefore as a result of this research the innovation created will hopefully 'make a difference'. Robson (2001) highlights research that should create a better understanding of a situation and so to '... suggest ways in which desirable change might take place; and perhaps to monitor the effectiveness of these attempts'. This innovation should provide the 'desirable change', and the evaluation will 'monitor the effectiveness' of this innovation.

As outlined by Hurst (1996) feedback from students is rarely sort. As Fuller *et al.* state (2004) '... the voice of the disabled students themselves has hardly been heard.' The Disability Discrimination Act (DDA) (1995) with the addition of the Special Educational Needs and Disability Act (2001) accept that there is such a thing as dyslexia and refer to it as a disability. Therefore appropriate support should be put in place in all areas of education, including higher education, so attempting to provide a 'level playing field'.

Background

Dyslexia is an enigma. Although it has been observed for over a century there still is not one definition that covers all individuals. As Ott (1997) outlines in the late 19th

century it was referred to as 'word blindness'. This description is still used in the 21st Century. However, it is far more than 'word blindness' or difficulty with words.

The British Dyslexia Association's (BDA) (2007) definition of dyslexia states

"It is characterised by difficulties with phonological processing, rapid naming, working memory, processing speed and the automatic development of skills that are unexpected in relation to an individual's other cognitive abilities.

These processing difficulties can undermine the acquisition of literacy and numeracy skills, as well as musical notation, and have an effect on verbal communication, organisation and adaptation to change.

Their impact can be mitigated by correct teaching, strategy development and the use of information technology."

As outlined by Mortimer (2003, p 49) current research tends to focus on

"... a deficit model of weaknesses in one or more of the following areas:

- *phonological processing*
- *short term memory*
- *visual deficits*
- *automaticity"*

Both of the above descriptions emphasise the negative aspects usually recognised by society. West (1997) and Davies (1997) are writers who are dyslexic and they outline the positive aspects of dyslexia. As West argues these are important for the future of society.

The BDA also states that dyslexia persists across the life span. As Frith (1997 pg. 8) points out

"No one with experience of dyslexia doubt that dyslexic children become dyslexic adults, regardless of the improvements they show in reading ... dyslexia is not a disease, which comes with school and goes away with adulthood."

Higher education, disabilities and dyslexia

Britain needs to be competitive in the modern world, this includes the academic world. The Dearing Report (1997) investigated 'Higher Education in the learning society'. It stated that it should 'encourage and enable all students ... to achieve beyond their expectations' (1.4) and that one of the areas under-represented was that of people with disabilities. This report highlighted the need for universities to widen their clientele, to include a more diverse population. In order to do this, universities need to introduce and develop a variety of courses and attract a broader spectrum of students. Universities need to adapt not just accept.

Such a diverse population will include individuals who may be or are dyslexic. This is frequently seen as a 'hidden handicap' as the characteristics of the dyslexic brain can be hidden or not recognised. British universities need to acknowledge the strengths of the dyslexic brain as opposed to emphasising the difficulties. West (1997) argues strongly that higher education has been slow to change and can still rely heavily on traditional academic methods such as the use of texts and lectures. He believes that people who are dyslexic are frequently very visual and that the future lies with the visual thinker. He argues that visually orientated tools and processes might prove to be especially fruitful for many different kinds of students with different talents and different brains. With widening participation within higher education and the inclusion of 'disabled' students such as dyslexics the university society must look for and recognise these strengths. These may be very important for future societies and employment.

Universities have a duty to support or remove situations that create problems for 'disabled' students. But it is only by understanding these issues that they can be addressed by the university. Building on this research it is possible to develop appropriate understanding and support. This in turn will support the student who is dyslexic through their course, developing their confidence and self-esteem and so enable them to achieve their potential and make their full contribution to society.

Negative experiences for students who are dyslexic

The BDA definition identifies a number of areas that can be difficult for dyslexics. The two areas to be addressed in this project are the social and emotional implications of dyslexics and the presentation of information. Little research has been carried out into these aspects of dyslexia, particularly with students in higher education. Patoss (2005, p. 3) states that

“... moving into Higher Education represents a significant transition which will often exacerbate the problems for students with SpLDs. [SpLD, Specific Learning Difficulties which includes dyslexia]...”

The social implications of previous experiences can have a lasting negative effect on all students, but particularly mature students. Experiences in school can cause anxiety and lack of self-esteem and confidence. As Mortimer (2003) states 'Many dyslexic teenagers may have endured a lifetime of being told – or simply telling themselves – that they are hopeless'. How much truer must this be for the adult who has 'endured' their dyslexia for longer. Research carried out by Paget and Reynolds (1984), Casey, Levy, Brown and Brooks-Gunn (1992) as cited by Farmer, M, Riddick, B., and Sterling, C. (2002) and more recently by Anderson (2007) have highlighted the anxiety experienced by school pupils when asked to talk out loud in front of the class. This in turn influences the self-esteem and confidence of the pupil. As dyslexics can experience this on a daily basis it can have long term consequences. Little research has been carried out for the adult population. Singleton *et al* (1999) report on the 'damaged self-esteem and high anxiety' experienced by university students who are dyslexic. Research carried out by Carroll and Iles (2006 p. 659) concluded that 'dyslexic students in higher education show anxiety levels that are well above what is shown by students without learning difficulties.' Previous negative experiences

frequently add to the fear and frustration experienced when faced with a situation in which their reading abilities will be tested.

The second area to be addressed is the presentation of text. Over the past 15 years there has been much emphasis on phonological awareness and dyslexia. Saunders (2006) points out that it is important not to ignore other possible difficulties, one of these being 'visual confusion'. Dyslexics frequently complain that letters and words 'move around' therefore making reading difficult. This syndrome researched by Stein and Fowler (1981) was referred to as Scotopic Sensitivity. Recent research has advocated the more accurate term of Visual Stress. Individuals reading black print on a white background can experience, amongst other things, unstable words and letters, the text becoming blurred or fuzzy, seeing the white paper rather than the black print and headaches. Depending on the definition used of dyslexia this can be part of the dyslexia or frequently experienced by dyslexics.

Research carried out by Stein and Fowler (2005, p.15) indicates that it is not the words that move around but that the eye is not stable. They state that

“There is now much evidence that these visual confusions probably result from a mild impairment of a particular kind of nerve cell. Large (magnocellular) cells in the visual system are responsible for timing visual events, hence for signalling any motion of images across the retina.”

They go on to hypothesise that 'yellow filters might help children with magnocellular deficits.'

Although much of this research has been carried out with children, adults also have similar experiences.

Support using ICT

One way of getting around these difficulties is with the use of ICT. Research has identified the importance of using ICT to support students who are dyslexic. The results of research carried out by Close (2006) states there is no doubt that '... technological aids are revolutionising the efficiency of dyslexic people...'. Crivelli (2006) states that 'ICT is recognised as a key tool to help dyslexic learners in the classroom in both learning and teaching experiences, as well as accessing or recording written information' and 'When ICT is used effectively, many of the barriers to and differences in learning can be reduced or overcome.' The use of ICT is obviously a way of supporting students, enabling and empowering them. These are all important aspects in order to give the student control over their situation.

As reading is frequently an issue for dyslexics the print used both in text and on the computer screen is an important issue. As Crivelli (2006) points out there are format options that can support these difficulties. Background colour, font size, style and colour can all be easily changed to accommodate those with reading difficulties. The font used needs to be uncluttered such as a sans serif font and size Point 12 or above.

Unfortunately the print on forms is usually small, using an unsupportive font such as Times New Roman with blocks of information making them difficult to follow. This

in turn leads to frustration at not being able to read them and to future avoidance tactics when required to fill in any form.

Development of the innovation

During 2006/7 I carried out a small scale piece of research with dyslexic students at my university. This was aimed at discovering the difficulties they had when applying for the Disabled Students' Allowance. This is an allowance provided by the local authority to provide support in order to make a 'level playing field' for students who have been identified as being dyslexic. The main conclusion from this research was the difficulties experienced when having to read and fill in the necessary form.

Student A said 'The [DSA] forms are quite difficult ... you needed someone to read it...', Student B talked about the difficulties of 'filling in the forms and having to read everything.' and Student D '... a lot of students might not actually bother with it because it is so hard to fill in'. Research outlined by McLoughlin (2002) emphasises the difficulties dyslexics experience when carrying out this activity. Gilroy and Miles (1996) identify difficulties with the paperwork for the DSA saying that students need some help over claiming it.

From the dyslexic perspective there are a number of issues involved when filling in the DSA form. I experience too many dyslexic students who come to university thinking that they are 'thick' and are concerned that they should not be there. As Student B said 'I always thought that I wasn't that clever...'. These students come to university with their own personal life experiences. These unfortunately can have a negative effect on the student. Society's perception of dyslexia is one in which the weaknesses are assumed to be those of poor reading, writing and spelling. In our society this equates to being 'thick' or stupid.

In order to support these students a method of presenting this form needed to be developed. If such an innovation could be developed it would give the student control over their situation, an important aspect of being independent, frequently relevant to those who have 'suffered' from dyslexia. Such an innovation would save time and money as mistakes could be prevented and therefore the support could be put in place sooner. This is particularly important as support can be needed immediately students enter university but certainly as soon as the student starts receiving assignments. If this innovation is put in place it will also save the time of university staff who at present spend time supporting this activity.

The method of presenting this innovation is important. As has been discussed earlier dyslexics respond well to ICT. It can remove the fear of making mistakes and consequently feeling stupid. This is so often experienced by dyslexics; even those that have reached higher education, or particularly those who have reached higher education, as they feel because of past experiences they should not be there. As reading is an issue the contents of the form needs to be read out loud. Software that they may use in the future highlights the words as they are read, so this method of presenting the text was introduced. The application used is called 'Flash'. This not only introduces the student to methods they may use in the future it also supports their reading as the word is highlighted and is therefore visual as it is spoken and therefore aural. This uses multi-sensory teaching and learning as advocated by the BDA.

All these ideas needed a professional approach to creating the innovation or web based guide. This was provided by an E Developer from the university. As we both had our own areas of specialism we needed to work together to produce the desired effect. Good communication was an important element.

In developing this guide Adobe Flash and Photo Shop were the main tools used as the integration between them is good. Flash is the industry standard for creating rich or interactive web based applications. Originally Flash was developed as an animation tool but as its use grew it has been used as a developmental tool. From the E Developers point of view it integrates easily with other software. The images and graphics used such as the buttons and slider were produced and edited in PhotoShop.

The E Developer had problems scanning in the relevant forms. These eventually had to be typed in individually. This was very time consuming. There was also a problem when putting the guide onto the Internet. The normal web page constraints did not apply when put on to the Internet browser. It could not be stretched and therefore the E Developer was unhappy with the final appearance of the guide. At this point the guide was too well developed for it to be altered. When the guide was tested it was found that sometimes the speech did not synchronise with the highlighted words. This was eventually diagnosed as 'a bug' in the software. If this procedure were to be carried out again this would need to be addressed.

It was important that the web based guide could be found easily. It was hoped that it would be used both by current students and prospective students. It was therefore important that it did not need a password to open it. It was hoped that it could be opened with 'just two clicks' so that students could find it easily.

Throughout its development the guide was checked by a variety of people. Although I have much experience working with dyslexics I do not experience the difficulties myself. So it was important that dyslexics checked it. We received useful comments and suggestions from these students. In order to follow the comments made the web based guide can be found at:

http://www.wlv.ac.uk/files/flash/DSA-guide_2007-08.swf

Initial evaluation

As I am in regular contact with many of my students I was able to ask certain of them to try out the guide. They e-mailed their responses and then any further discussion was carried out on a face to face basis.

Student Z e-mailed to say

"That's amazing"

His comments and suggestions included:

"If the slider is slid back and forth (on the second page) the blue highlighted letters don't keep up with the audio."

In discussion with the E Developer it appeared that this was an issue with the software used. In future it was decided to use different software for future web links.

“ What is a DSA1 and PNI (a picture like the pen and passport would be good).”

As Student Z said a new student may be unaware of these forms. This has been done.

“When the boxes are highlighted e.g. page two needs to be more defined (shaded and flashing) rather than a thin line blue box.”

I talked to the E Developer about this and he said that he could change it. He obviously had a different idea from mine. Good communication between us resolved this issue as we were able to discuss the options and select the one I thought was most appropriate.

Student Z's final comment was

“An excellent idea and I wish I had had that help when filling in my form!!!!”

Student Y's comment was

“I think it's great, really clear ... Really clear and easy to follow.”

This student was concerned with the section on financial arrangements. In discussion with the E Developer it was decided that there was a limit to the amount of support given through the guide as it could become unwieldy. This was therefore not addressed initially.

As it was to be recommended by the staff in the Enabling Centre, it was important that they were also happy with the layout and that they could see the usefulness of it. A number of staff were therefore asked to check the guide. One member of staff said she had not realised how useful it would be until she actually saw the completed web link.

Experienced tutors were also asked for their opinions. Comments included:

“I think it's fantastic! Which software did you use to produce this, it could be useful for other things? “

This may be relevant in the future as further documentation may be provided in different formats.

Other comments included:

“I like the layout - it seems really user friendly.”

“... clear voice makes easy listening. A good speed of delivery. I like the way in which the student is navigated through the various sections of the documents.”

“I also think it highly appropriate to read out the declaration on pages 15 and 16. Overall ... a really user friendly guide ...”

As another independent member of staff said

“I think this is fantastic! ...is this method going to be applied to all forms received by Dyslexic students? The possibilities are endless!!!”

And finally individuals outside the fields of dyslexia or higher education were asked to proof read it.

These responses were interesting. As everyone made different suggestions I concluded that there was not one major area that needed addressing. The one area that I found surprising was the difficulty I found of proof reading it. This is something I need to be aware of when working with students as a support tutor.

Outcome

The final version of the web based guide for students who are dyslexic to use can be found at:

http://www.wlv.ac.uk/files/flash/DSA-guide_2007-08.swf

Although the guide has been evaluated by a number of people it is not until it is in use on the university web site that it can be properly evaluated. This will be done throughout the coming year as students use it to apply for their DSA. As a dyslexia support tutor I will have the opportunity to discuss the usefulness of the innovation with students at the university. This will be in the form of semi-structured interviews. The same format of interviews, although using different outline questions, will also be used with the university staff involved. As part of this evaluation my own knowledge can be developed by investigating the construction and use of questionnaires. This may be particularly relevant as interest has been shown by other universities and the British Dyslexia Association. A well constructed questionnaire distributed to these users would give both qualitative and quantitative data. Such a questionnaire can then be distributed and the replies analysed.

Future developments

Before the innovation was available on the university web site it has produced much interest. The dyslexia section of the web site is being redesigned with the possibility of using the same method of presentation. Non dyslexics have looked at the innovation and suggested that this method would help other students when filling in the numerous forms necessary when applying for a university place. On talking to the Dean of Students it is evident that many students have difficulties with the form PN1 – Application for Finance. I have requested that I work with the university E Developer to produce this form in the same format. Hopefully this will happen in the future and it will be interesting to evaluate the responses.

In my experience, too often people who are dyslexic are told what they can and can not do. They do not have control of their own lives. This is not appropriate both on an individual level and for the benefit of society as a whole. Producing this web based guide enables such students to be in control of this part of applying for DSA. It enables them to complete the form without having to ask for help. This in itself supports confidence and self-esteem. From my perspective and the success of the innovation it was important to ask the student what they thought of it. This was also important because hopefully it made the student feel valued as their responses were asked for and responded to. Hopefully this supported confidence and self-esteem.

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